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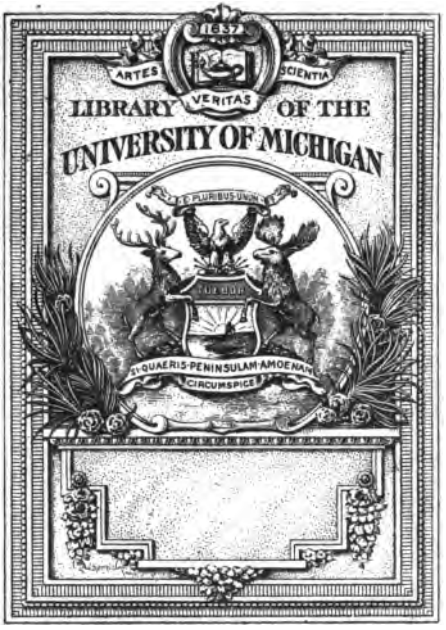
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Yours Truly
R. P. Davidge

TRANSACTIONS

OF THE

FORTY-NINTH ANNUAL MEETING

OF THE

Ohio State Medical Society

HELD AT

ZANESVILLE,

MAY 16, 17 AND 18, 1894.

Printed and published by order of the Society.

TOLEDO, OHIO:
BLADE PRINTING AND PAPER CO.
1894.

Semi-Centennial Meeting

——OF THE——

Ohio State Medical Society.

Will be held in State House, Columbus, May 15, 16, 17, 1895.

COMMITTEE OF ARRANGEMENTS.

N. R. COLEMAN, M. D., Columbus, - - Chairman.
Chairman of Sub-Committee on Exhibits.

H. P. ALLEN, M. D., Columbus, - - - Treasurer.
Chairman of Sub-Committee on Finance.

D. TOD GILLIAM, M. D., Columbus, - - - -
Chairman of Sub-Committee on Entertainment.

T. W. RANKIN, M. D., Columbus, - - - -
Chairman Sub Committee on Transportation and Hotels.

J. C. GRAHAM, M. D., Columbus, - - Secretary.
Chairman of Sub-Committee on Printing.

OFFICERS FOR 1894-5

D. N. KINSMAN, M. D., Columbus, - - - - - President.
C. O. PROBST, M. D., Columbus, - - - Vice-President.
M. STAMM, M. D., Fremont, - - - - - Vice-President.
J. C. BUCKNER, M. D., Cincinnati, - - - Vice-President.
ROBERT PETER, M. D., Canal Dover, - - - Vice-President.
THOMAS HUBBARD, M. D., Toledo, - - - - - Secretary.
CHAS. GRAEFE, M. D., Sandusky, - - - Asst. Secretary.
JAMES A. DUNCAN, M. D., Toledo, - - Treasurer and Librarian.

STANDING COMMITTEES.

FINANCE.

E. SINNETT, M. D., 1890. F. C. GRAY, M. D., 1892.
H. J. HERRICK, M. D., 1891. E. B. FULLERTON, M. D., 1893.
N. P. DANDRIDGE, M. D., 1894.

ETHICS.

H. D. HINCKLEY, M. D., 1890. CHAS. L. VAN PELT, M. D., 1892.
S. S. THORN, M. D., 1891. J. H. LOWMAN, M. D., 1893.
F. C. LARIMORE, M. D., 1894.

PUBLICATION.

C. A. L. REED, M. D, 1890. L. S. COLTER, M. D., 1892.
E. S. MCKEE, M. D., 1891. J. C. OLIVER, M. D., 1893.
J. P. SAWYER, M. D., 1894.
D. N. KINSMAN, M. D., *ex-officio.* THOMAS HUBBARD, M. D., editor.

LEGISLATION.

S. S. THORN, M. D., 1890. C. E. BEARDSLEY, M. D., 1892.
D. J. SNYDER, M. D., 1891. J. F. BALDWIN, M. D., 1893.
W. D. HAMILTON, M. D., 1894.

ADMISSION AND MEDICAL SOCIETIES.

C. F. CLARK, M. D., 1890. A. R. BAKER, M. D., 1892.
A. F. HOUSE, M. D., 1891. C. D. NOBLE, M. D., 1893.
W. C. CHAPMAN, M. D., 1894.

OHIO STATE MEDICAL SOCIETY.

At the Seventeenth Annual Meeting of the Ohio State Medical Society, the following resolution was adopted:

Resolved, That the publication of any address, prize essay, or other paper, by this Society, is no evidence of its endorsement of the sentiments therein contained.

FORTY-NINTH ANNUAL SESSION

OF THE

OHIO STATE MEDICAL SOCIETY,

HELD AT

ZANESVILLE, MAY 16, 17 AND 18, 1894.

MEMORIAL HALL,

ZANESVILLE, MAY 16, 1894.

The meeting was called to order at 2:20 P. M., Wednesday, 16th, by President N. P. Dandridge. Reverend Doctor Chas. E. Barnes offered prayer, after which Dr. Edward C. Brush delivered the Address of Welcome, and was followed by Dr. J. C. Crossland giving the report of the Committee of Arrangements.

Dr. W. J. Conklin moved that the Secretary be authorized to employ a stenographer to report the proceedings of this session. Seconded and carried.

The Society received a congratulatory telegram from the Illinois State Medical Society in session, and on order to the Secretary returned the greeting.

The ladies of the Hospital Association of Zanesville sent a cordial invitation to visit the hospital, which was duly acknowledged on motion of Dr. E. Sinnett, of Granville.

The Treasurer's report was then read and referred to the Finance Committee.

TREASURER'S REPORT.

RECEIVED.

Balance as per cash account	$ 122 80	
Dues, account membership	1,412 00	
Guarantee fund	500 00	
Advanced by Treasurer	39 39	
		$2,074 19

DISBURSED.

Freight and express charges	$ 74 03	
Postage stamps	137 54	
Printing and stationery	60 60	
Stenographic report convention	50 00	
Publication Transactions, 1892	439 25	
Publication Transactions, 1893	652 67	
Dues refunded	4 00	
Salary Secretary, 1891 and 1892	250 00	
Exchange, bank collections, dues	20 10	
Central Traffic Association	11 00	
Refunded Guarantee Fund	375 00	
		$2,074 19

JAMES A. DUNCAN, *Treasurer.*

LIBRARIAN'S REPORT.

From thirty-seven states the library has one hundred and eighty-seven volumes. Of the annual Transactions of the Ohio State Medical Society, there are five hundred and seventy-seven copies.

JAMES A. DUNCAN, *Librarian.*

The Finance Committee was called and filled by appointment by the President. Dr. E. Sinnett, Dr. H. J. Herrick, Dr. X. C. Scott, Dr. C. E. Beardsley, Dr. E. B. Fullerton, composed this committee.

The annual report of the Secretary was then called and read.

ANNUAL REPORT OF SECRETARY.

In June, 1893, the Special Executive Committee's resolution instructed the Secretary to enroll as members "*All members of affiliating societies who shall already have paid their annual dues.*" Owing to changes in officers in local societies, and for other reasons, it was soon discovered that it would take some months to ascertain who (members of affiliating societies) had paid their dues and thus ratified their membership in the State Society. Consequently we were compelled to consider as members *all the members of such societies as had affiliated.* In view of the uncertainty as to who had paid dues, and also the ambiguity of the instructions under which we were acting, it was necessary to publish, Transactions '93, all members of affiliated societies as members of the State Society; but in order that it might clearly be understood how such membership was attained, these society catalogues were kept intact and published as a body under the page heading "Members of Ohio State Medical Society." In making up the list of affiliated societies the published list in Transactions 1892 was relied on.

The Treasurer having now ascertained what members of affiliated societies have paid their dues, it is possible to eliminate from the roll of membership all those that have refused to ratify their membership by the payment of their dues. The question on which instructions are needed is: Are such quasi-members who have never accepted the offer of membership individually entitled to the usual three years of grace in which to make up arrearages of dues?

If there are some names enrolled as members through the affiliation method of entering (1) who have been previously dropped for non-payment of dues, or (2) have been at any time refused recommendation by the Committee on Admission, the Secretary should be instructed to refer all such cases to the Committee on Admissions for decision (1) as to what sum is due the Society and (2) determine their present eligibility.

Accompanying the list of auxiliary societies are notes of changes in them so far as their relation to the State Society is concerned.

The following communications of importance have been received, copies of which are at hand:

1. New York State Society, urging the Ohio State Society to formally endorse and maintain the present Code of Ethics of the American Medical Association.

2. Communication from secretary American Medical Association, urging State societies to take action for or against the Code of American Medical Association, and to use their influence to secure good medical practice laws in their respective States.

3. Copy of a Bill for Prevention of Blindness, which became a law in this State March 13, 1894.

4. A communication from State Board of Health, Dr. C. O. Probst, Sec'y, in reply to resolution offered by Dr. W. J. Scott and passed at last meeting by this Society, informs us that: Every city now has a board of health. Five hundred out of seven hundred villages have boards of health. Nine hundred townships out of thirteen hundred have boards of health.

5. Letters and telegrams from the East, New York and Baltimore, the senders, presumably candidates for practice in the State of Ohio (at least one of whom used a fictitious name), desiring to know if the Medical Practice Act was a law of this State. The Secretary was strongly tempted to reply that as we now had a law for "Prevention of Blindness" a Medical Practice Law would naturally follow.

LIST OF AUXILIARY SOCIETIES.

1. Academy of Medicine, Cincinnati, David DeBeck, M. D., Secretary, 9th and Race.
2. Adams County Medical Society, Jas. W. Bunn, M. D., Secretry, West Union.
3. Allen County Medical Society, H. C. Bennett, M. D., Secretary, Lima.

4. Ashland County Medical Society, R. C. Kinnaman, M. D., Secretary, Ashland. (Catalogue for 1894 not sent in.)

5. Ashtabula County Medical Society, W. O. Ellsworth, M. D., Secretary, Austinburg.

6. Belmont County Medical Society, J. W. Cooper, M. D., Secretary, Bellaire.

7. Brown County Medical Society, L. Markley, M. D., Secretary, Georgetown.

8. Butler County Medical Society, H. H. Carter, M. D., Secretary, Hamilton.

9. Central Ohio Medical Society, Geo. M. Clouse, M. D., Secretary, Columbus.

10. Champaign County Medical Society, H. M. Pearce, M. D., Secretary, Urbana.

11. Clarke County Medical Society, W. A. Smith, M. D., Secretary, Springfield.

12. Clermont County Medical Society, A. W. Ashburn, M. D., Secretary, Batavia.

13. Clinton County Medical Society. (No meeting for 10 months.)

14. Columbus Medical Club, J. W. Wright, M. D., Secretary, Columbus.

15. Crawford County Medical Society, A. M. Duncan, M. D., Secretary, Bucyrus.

16. Cuyahoga County Medical Society, F. S. Clarke, M. D., Secretary, Cleveland.

17. Erie County Medical Society, C. E. Perkins, M. D., Secretary, Sandusky.

18. Fayette County Medical Society, E. M. Boggess, M. D., Secretary, Washington C. H.

19. Geauga County Medical Society, A. D. Warner, M. D., Secretary, Burton.

20. Greene County Medical Society, C. M. Galloway, M. D., Secretary, Xenia.

21. Hancock County Medical Society, J. P. Baker, M. D., Secretary, Findlay.

22. Hempstead Mem. Academy Medicine, M. S. Pixley, M. D., Secretary, Portsmouth.

23. Highland County Medical Society, Lockhart Nelson, M. D., Secretary, Hillsboro.

24. Hildreth District Medical Association, N. E. Patrick, M. D., Secretary, Zanesville.

25. Holmes County Medical Society, D. S. Olmstead, M. D., Secretary, Millersburg.

26. Jefferson County Medical Society, A. A. Elliott, M. D., Secretary, Steubenville.

27. Licking County Medical Society. (No meetings for some time.)

28. Mahoning County Medical Society, R. E. Whelan, M. D., Secretary, Youngstown.

29. Marion County Medical Society, Dana O. Weeks, M. D., Secretary, Marion.

30. Meigs County Medical Society, W. E. Ard, M. D., Secretary, Pomeroy.

31. Miami County Med.-Chir. Society, Warren Coleman, M. D. Secretary, Troy.

32. Miami Valley Medical Society, Con Gatch, M. D., Secretary, Milford.

33. Montgomery County Medical Society, Robert Stein, M. D., Secretary, Dayton.

34. North Central Ohio Medical Society, R. F. Grubaugh, M. D., Secretary, Mansfield.

35. North-Western Ohio Medical Association, Chas. Graefe, M. D., Secretary, Sandusky.

36. Piqua Medical Society, J. H. Lowe, M. D., Secretary, Piqua.

37. Portage County Medical Society, Geo. J. Waggoner, M. D., Secretary, Ravenna.

38. Ross County Medical Society, Chas. Miessa, M. D., Secretary, Chillicothe.

39. Sandusky County Medical Society, R. H. Rice, M. D., Secretary, Fremont.

40. Shelby County Medical Society, M. F. Hussey, M. D., Secretary, Sidney.

41. Stillwater Medical Society, D. W. Copeland, M. D., Secretary, Piedmont.

42. Summit County Medical and Surgical Society, J. H. Seiler, M. D., Secretary, Akron.

43. Toledo Medical Association, Chas. A. Faber, M. D., Secretary, Toledo.

44. Trumbull County Medical Society, J. Harmon, M. D., Secretary, Warren.

45. Tuscarawas County Medical Society, J. A. McCollam, M. D., Secretary, Uhrichsville.

46. Union Medical Association Columbiana and adjoining counties, Paul E. Barckhoff, M. D., Secretary, Salem.

47. Union Medical Association North-Eastern Ohio, L. E. Sissler, M. D., Secretary, Clinton.

48. Warren County Medical Society (formerly Lebanon), H. J. Death, M. D., Secretary, Franklin.

49. Washington County Medical Society, F. E. McKim, M. D., Secretary, Marietta.

50. Wayne County Medical Society, Jos. E. Barrett, M. D., Secretary, Wooster. (Catalogue for 1894 not sent in.)

51. Columbus Academy of Medicine, J. C. Graham, M. D., Secretary, 73 E. State. Admitted 1894.

52. Eastern Ohio Medical Association, J. C. M. Floyd, M. D., Secretary, Steubenville. Admitted 1894.

53. Muskingum County Medical Society, J. M. Fassig, M. D., Secretary, Zanesville. Admitted 1894.

54. Pike County Medical Society, A. E. Bumgarner, M. D., Secretary. Admitted 1894.

Bay City Medical Society consolidated with Erie County Medical Society.

Cincinnati Medical Society consolidated with Academy of Medicine.

Lebanon changed to Warren County Medical Society.

Medical Association, Delaware, defunct.

South-Eastern Ohio Medical Association, no report obtained.

Wood County Medical Society, defunct.

Forty-nine secretaries of local societies have sent in catalogues of their respective societies between the first of March and the middle of April, 1894. The prompt responses of the majority to the many demands from the Secretary of State Society evidences the cordial support that they give to the central organization. Only two out of the fifty-one have failed to respond, namely, Wayne and Ashland.

We would respectfully call the attention of local secretaries to the fact that obituary notices and memorial tablets should be sent to the Secretary of the State Society in order that list may be corrected and the same properly inserted in the Transactions.

The following bills have been approved and paid by the Secretary:

To Stationery, record, letter file, etc	$ 5 15
Melchior Bros., addressing, folding, etc., 2,300 constitutions	10 00
To stationery and constitutions	20 75
Stamped envelopes, constitutions	22 40
Stamps, postals, delivery, etc	22 55
Blade Printing and Paper Co., stationery	2 50
Eight hundred programs	10 50
Twenty-five hundred programs	13 75
Total	$107 60

Invoice of articles received from ex-Secretary T. V. Fitzpatrick, June, 1893: One traveling case, gavel presented by E. Sinnett, 1872, one society seal, two record books, application membership and delegate blanks, etc.

(Signed)

THOMAS HUBBARD, *Secretary.*

On motion of Dr. G. A. Collamore it was accepted and the financial portion referred to the Committee on Finance.

Dr. G. A. Collamore presented the report of the Special Committee on Revision of the Constitution and By-Laws.

It was moved that the revised Constitution, as submitted by the Special Committee, be adopted. Seconded.

The question was raised as to who were eligible to vote. The President decided in accordance with Sec. 10, Art. III. Discussed by Drs. Collamore, Scott, Allen and Alcorn.

Question on adoption of the revised Constitution carried by an unanimous rising vote. The President ruled that the new Constitution was in force from the time of its adoption.

A telegram was received from the Iowa State Medical Society in session, and duly acknowledged. The greeting of the Society was ordered to be sent to the Missouri State Medical Society in session.

The President then appointed the following members on Committee on Nominations: Dr. Dudley P. Allen, Cleveland; Dr. Geo. A. Collamore, Toledo; Dr. W. J. Conklin, Dayton;

Dr. Thad. A. Reamy, Cincinnati; and Dr. W. J. Scott, Cleveland.

The regular scientific work of the Society was next in order.

"The University and Medical Education" was the title of a paper read by D. S. Kellicott, Prof. Zoology and Entomology, Ohio State University. Discussed by Dr. Dudley P. Allen, Dr. H. J. Herrick, Dr. W. J. Scott, and the discussion closed by the author.

The following were appointed members on the Committee on Admission: Dr. W. C. Chapman, Toledo; Dr. J. A. Thompson, Cincinnati; Dr. F. C. Larimore, Mt. Vernon; Dr. J. C. Culbertson, Cincinnati; and Dr. A. E. Bell, of Zanesville.

"The Prevention of Tuberculosis" was read by Dr. C. O. Probst, Columbus.

"Infection in Tuberculosis. Food Products." Dr. H. H. Spiers, Ravenna.

"Is Consumption Curable?" Dr. R. E. Chambers, Chandlersville.

The three papers were then discussed by Dr. W. C. Chapman, Dr. H. S. Straight, Dr. C. E. Beardsley, Dr. H. J. Herrick, Dr. Jno. Murphy, and the discussion closed by Dr. C. O. Probst.

"Scarlatina," Dr. Amelia J. Prior, Cincinnati.

"Diphtheria," Dr. J. S. Haldeman, Zanesville.

Adjourned.

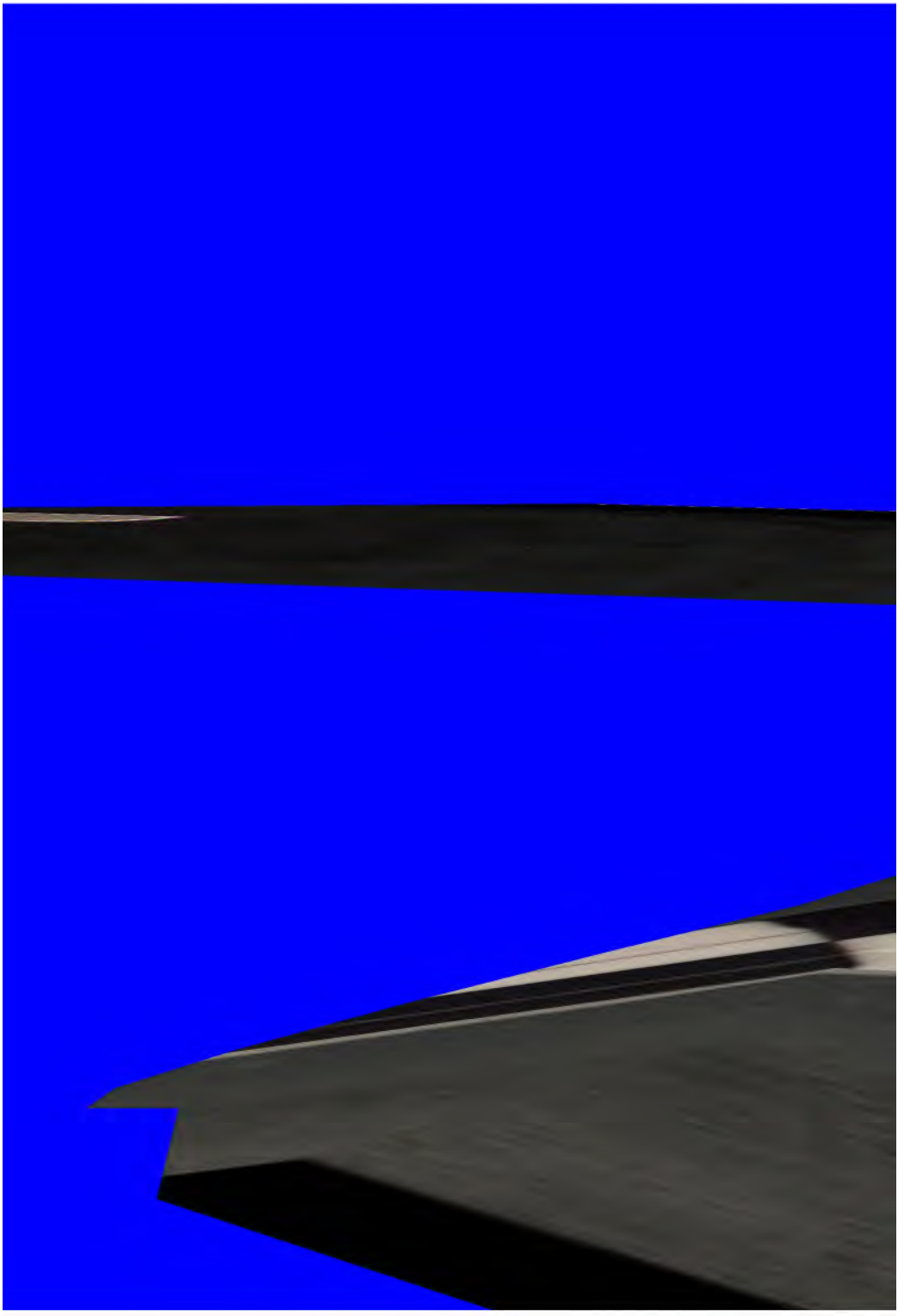
Wednesday Evening, 7:40 P. M.

Vice-President Dr. F. C. Larimore called the meeting to order.

"The Prevention of Pertussis," Dr. Geo. M. Clouse, Columbus. Discussed by Dr. Kinsman, Columbus; Dr. Probst, Columbus; Dr. Thompson, Cincinnati, and the author.

"The Physician," Dr. Samuel Hart, Marietta.

The President took the chair.



Discussed by Dr. Dudley P. Allen, Dr. Leonard Freeman, Dr. M. Stamm, Dr. Herrick, Dr. Reamy, Dr. Larimore, Dr. Forbes and the author.

"Practical Application of the Principles of Sterilization," Dr. Hunter Robb, Johns Hopkins University, Baltimore. Discussed by Dr. J. C. Oliver, Dr. C. A. L. Reed, Dr. Kelly and Dr. Dandridge.

"Gastrostomy; A New Method," Dr. M. Stamm, Fremont.

"The Radical Cure of Hernia," Dr. F. C. Larimore, Mt. Vernon. Discussed by Dr. Lawrence, Dr. C. N. Smith and Dr. Means.

It was moved and seconded that the program henceforth be adhered to in order. Carried.

The Committee on Admission made a supplementary report.

The following committees were announced:

Publication Committee: Drs. C. A. L. Reed, G. A. Collamore, J. C. Oliver, W. W. Hall and Dr. C. N. Smith.

Committee on Legislation: Drs. Beardsley, Snyder, Probst, Hoover and Dr. Sabin.

Committee on Ethics: Drs. Sawyer, W. D. Hamilton, Coleman, L. Freeman, and Dr. Graham.

Second Day. Morning Session.

SECTION ON PRACTICE OF MEDICINE.

The meeting was called to order at 9:00 A. M. by Vice-President S. L. McCurdy, in the Board of Trade Room, Memorial Building.

The first paper read was "Studies in Immunity and Treatment of a Specific Fever, *i. e.*, Hog Cholera," Dr. D. N. Kinsman, Columbus. Discussed by Dr. W. J. Scott, Dr. J. E. Fackler, Dr. Eli Conn, Dr. C. E. Beardsley, Dr. Cone, Dr. Lindsay, Dr. Spiers, Dr. Graham and the author.

"Is there a Better Remedy in Cholera?" Dr. E. B. Fullerton, Columbus. Discussed by Dr. Bleile, Dr. Gordon and the author.

"The Rationale of Systematic Elimination in the Treatment of Typhoid Fever," Dr. Robert Peter, Canal Dover.

"Typhoid Fever," Dr. John E. Woodbridge, Youngstown. Discussed by Dr. Collamore, Dr. Murphy, Dr. Cone, Dr. Herrick, Dr. Beardsley, Dr. Sinnett and the authors.

Adjourned at 12:20.

SECOND DAY. THURSDAY AFTERNOON.

GENERAL EXECUTIVE SESSION.

The session was called to order at 2:00 P. M., Dr. Dandridge in the chair.

The minutes of the previous day were read by the Secretary and approved.

The following gentlemen were appointed delegates to the American Medical Association: Dr. Starling Loving, Dr. Taylor, Dr. X. C. Scott, Dr. William Bricker, Dr. M. Stamm, Dr. S. N. Fowler, Dr. R. C. S. Reed, Dr. Holston, Dr. Woodbridge, Dr. Alcorn, and Dr. Benj. F. Hart.

Dr. Sinnett reported for the Committee on Finance as follows:

ZANESVILLE, May 16, 1894.

The Finance Committee have this day examined the books, accounts and vouchers of the Treasurer, and find the same correct.

They also find that there is yet due from Dr. G. I. Cullen, our former Treasurer, $115.20, which they advise to collect.

They have also audited an old account of Dr. T. W. Jones, for $58.78, which they recommend for payment.

An account is also presented by Mr. J. J. Noland for $75.00, for services as expert bookkeeper, which they approve and recommend for payment.

We have also found the Secretary's account correct, and there is due him, for money paid for the uses of the Society, $107.60.

The Treasurer has also advanced, for the uses of the Society, $39.39.

Your indebtedness thus stands $280.77.

(Signed)

E. SINNETT,
X. C. SCOTT,
C. E. BEARDSLEY,
H. J. HERRICK,
} *Committee.*

It was moved and seconded to adopt. Carried.

The report of the Committee on Publication was read by the Secretary:

Bids for the Transactions were based on an edition of 600 copies of 450 pages each, 50-lb. paper, 37 lines to the page, set long primer, and bound as per sample furnished.

Four bids were received, viz.:

Elm St. Printing Co	$550 00	and	$1 00	for	each	extra	p.
Chas. LeCount	525 00	"	90	"	"	"	
Earhart & Richardson	427 50	"	75	"	"	"	
S. F. Roettcher	425 00	"	75	"	"	"	

The last bid was withdrawn, so the contract was awarded to Earhart & Richardson.

The bill of the printers, as endorsed by the Committee on Publication, was as follows:

600 copies, 448 pages	$427 50
Extras, postage, etc	86 67
Reprints	138 50
	$652 67

Respectfully submitted as the report of the Committee on Publication, with the suggestion that the Secretary of the Society be appointed Editor, with an addition of $100.00 to his salary.

(Signed) CHARLES A. L. REED,
Chairman.

Dr. Chas. A. L. Reed: Mr. Chairman, in submitting that report, permit me to say on behalf of the committee, that

the recommendation that accompanies it is just and in accordance with the past custom of the Society, that of giving an honorarium to the Editor, which has been carried on for some time but has been omitted recently because of the paucity of our finances.

Dr. X. C. Scott moved the acceptance of the report, and adoption of the suggestion appointing the Secretary Editor with $100.00 honorarium. Seconded by Dr. Barton and carried.

Reading of the minutes of the Section on the Practice of Medicine. Approved.

Election of Officers.

Dr. C. A. L. Reed nominated Dr. Thomas C. Hoover, of Columbus, for President. This was seconded by Dr. X. C. Scott.

Dr. Thad. A. Reamy nominated Dr. D. N. Kinsman, of Columbus, seconded by Dr. Forbes, of Toledo, and Dr. Mead, of Columbus.

Drs. Hall, Smith, Case and Brigham were appointed tellers.

The ballot resulted in the election of Dr. D. N. Kinsman, of Columbus, as President. On motion of Dr. Reed his election was made unanimous.

The Committee on Nominations reported through Dr. Dudley P. Allen the following nominations:

First Vice-President, Dr. C. O. Probst, Columbus.

Second Vice-President, Dr. M. Stamm, Fremont.

Third Vice-President, Dr. J. C. Buckner, Cincinnati.

Fourth Vice-President, Dr. Robert Peter, Canal Dover.

Secretary, Dr. Thomas Hubbard, Toledo.

Assistant Secretary, Dr. Chas. Graefe, Sandusky.

Treasurer, Dr. Jas. A. Duncan, Toledo.

Finance Committee, unexpired term of '92 (Dr. Pomerine), Dr. F. C. Gray, Dayton.

Finance Committee, term of '94, Dr. N. P. Dandridge, Cincinnati.

Committee on Ethics, Dr. F. C. Larimore, Mt. Vernon.

Committee on Publication, Dr. Jno. P. Sawyer, Cleveland.

Committee on Legislation, Dr. Wm. D. Hamilton, Columbus.

Committee on Admission, Dr. W. C. Chapman, Toledo.

On motion they were declared elected.

Dr. H. P. Allen presented an invitation from the Columbus Academy of Medicine and the profession of Central Ohio for the Society to hold its next meeting in Columbus.

Dr. Haldeman presented the invitation of Piqua, on behalf of the Piqua Clinical Society.

It was decided to meet in Columbus, May 15, 16, and 17, 1895.

On motion of Dr. Forbes, the Secretary was instructed to request the use of the Hall of Representatives by immediate telegram.

The fact that the next meeting is to be the Semi-Centennial of the Society was duly recognized and appropriate celebration was suggested.

Dr. J. C. Culbertson moved that a Special Committee on State Legislation be organized, consisting of a chairman and one member from each county society in the State. Seconded.

Motion as amended reads: A Special Committee on State Legislation shall be organized for two years. Said committee to be composed of a chairman, appointed by the President, and representatives elected by each county society in the State. Where no county society exists, district societies may elect a representative. Where neither county nor district societies exist said committee may appoint representatives for said counties. The motion was carried.

The president appointed Dr. J. C. Culbertson chairman of the Special Committee on State Legislation. In discussion of this question,

Dr. Thompson said: Mr. President, before this important question is put to a vote, I hope the Society will consider

it thoughtfully and carefully. It is the most important measure which has come before the executive session. We have been working for years to get some medical legislation, but with failure. During the last year our attempt has failed again; there is just a possibility that it will succeed in Columbus to-day, but the thing which has been unfavorable to us is the lack of unanimity of our own members. If the doctors will agree upon what they want and present it in good shape, it will pass. Of every State of any importance in the Union, this is one of the last havens of refuge of the quacks, and so we have a harder fight to make than anywhere else in the Union. The secretary of the Board of Health states that he has been getting letters from all over the State asking what the requirements are here. They flock in here as the last open field. He says that these letters have become so numerous that he has quit answering them at all. To place our profession here upon a level of other States, we must become more united. Our politicians recognize only two motives for action: One is political influence, the other inherent justice in that which is *vigorously* demanded. We have not been organized sufficiently to present our claims with proper vehemence. This is the first and the most important step in this political organization which shall make our requests granted in Columbus. I hope we will have an unanimous vote.

Dr. Graham: If we have such a committee appointed, don't let the individual members of this Society sit down and wait for the committee to do all the work, but let every member of this Society appoint himself a committee of one. Tell your candidates you won't vote for them unless they vote for a medical bill; they will promise, and then hold them to it.

Dr. H. P. Allen: When you consider the disgraceful personnel of the lobby, quacks of the worst sort who have been there and just lived with the bill and newspaper men, it is almost enough to make a man disgusted with journalism and law making. If the medical profession is to have any-

thing, they must simply demand it as voters. Nothing that was done in Columbus had any particular influence upon the Legislature until a special committee was appointed, and when we passed a resolution that we would remember them in a political way they changed very decidedly. We must simply go to them and say, " We have eight thousand votes; we demand our rights." It will not do to sit back on our dignity and wait for the legislators to do it; we must just take off our coats and get down to work.

Dr. Culbertson: I want to say to the medical profession here to-day that we owe a very great debt of gratitude to Dr. Musgrove, of the Senate of the State of Ohio. There was no trouble in the Senate; it went through there against the partisan members and convictions of men who were there. To show you how much the Legislature is interested in this subject, and that it is interested in it more than in anything else, may be drawn from the fact that three separate and different times that bill was indefinitely postponed and afterward resurrected and put upon the calendar. That has never before happened in the House of Representatives of Ohio since it was a State. It shows the House of Representatives is interested in this matter, and are anxious to go home to their constituents and say that they have done what they agreed to.

The question was called and carried unanimously.

Dr. Thompson: I think it is only fair to the earnest effort Dr. Musgrove has made, that this Society transmit to him a vote of thanks through the President and Secretary of this Society. Carried unanimously. (Sent by telegram.)

Dr. J. C. Graham offered the following resolution:

WHEREAS, A convention of physicians, representing a majority of the medical societies of Ohio, irrespective of school, met in Columbus last December and after a conference formulated a medical bill, fair and just in its provisions, and said bill was introduced into the Legislature under the form and title of Senate Bill No. 13, by Dr. Mus-

grove, and passed that body without a dissenting vote, and is now pending before the House of Representatives:

Resolved, That this Society endorses the features of the Musgrove Bill, and urges upon the Legislature its speedy enactment into a law.

Dr. X. C. Scott moved the amendment, "as passed the Senate." Accepted.

Dr. X. C. Scott moved another amendment, making it a Board of eight instead of seven. (Not accepted.)

Dr. Reamy: I don't wish to discuss this subject, but would like to tell the gentleman that I was informed, not only in Columbus, but here, that the defeat of this bill was in part due to the very amendment which he now offers and advocates, and if we want the bill to continue in defeat, this amendment ought to be adopted; if not, and the bill is desired, let it remain without this amendment.

Dr. Coleman, Columbus: Those that have been at a distance have no doubt offered very valuable assistance, but those who have been constantly working know the excuses and reasons for rejecting and objecting to the various parts of this bill. It was amended in the House too late, and that was the point upon which the homœopathic division of the physicians of the State took objection. They wanted it eight and not to remain seven. Now, if we change that from the shape in which it came from the Senate, then we will have the same old fight over, and I want to say as one of the members who has worked there that it is immaterial whether the Board is seven or eight. It is comparatively easy to have a bill amended or changed, but it is one of the most difficult things to get a bill like that upon the Statutes of the State of Ohio. It does not commend us to begin to quibble about those small points. (Applause.) Let us as the united profession endeavor to place it upon the Statutes.

Dr. Graham: Whether the regular school shall have three or four is a matter of no importance. Without five no action of any kind can be taken in the Board.

Question on the amendment, that the Board be composed of eight instead of seven. Lost.

Question upon the original motion. Carried unanimously.

(The resolution in substance was sent by telegram to Senator Musgrove, and to Speaker Boxwell of the House, then in session.)

Dr. D. P. Allen, Cleveland, offered the following resolution: *Resolved*, That the Ohio State Medical Society learns with regret that the former appropriation for the support of the Surgeon-General's Library, amounting to $10,000, has, in the bill which has passed the House of Representatives, been reduced to $7,000. Since at least $10,000 is requisite for the support of the Library in the same condition as that of its former efficiency, this Society respectfully requests that the appropriation for the current year be placed at $10,000.00. Adopted. (Copies of this resolution were sent to the Surgeon-General, J. S. Billings, Senators Sherman and Brice, Representatives Outhwaite and Ritchie, and were duly acknowledged.)

Dr. C. A. L. Reed: WHEREAS, The bill making appropriation for the support of the army for the fiscal year ending June 30, 1895, was passed by the House of Representatives with the proviso, "that hereafter no appointments shall be made to the office of Assistant-Surgeon until the number of Assistant-Surgeons shall be reduced below ninety, and thereafter the number of officers in that grade in the Medical Department shall be fixed at ninety," thus making a reduction of thirty-five in number;

AND WHEREAS, Such a reduction in the number of medical officers would seriously impede the administration of the Army Medical Department and greatly interfere with a continuance of the high standard of proficiency that has heretofore characterized that department: therefore be it

Resolved, That this Society earnestly protest against the proposed reduction, and urge the Representatives and Senators from this State to prevent its enactment. Adopted.

(Copies sent Surgeon-General Billings, Representatives Ritchie and Outhwaite.)

Dr. C. A. L. Reed moved that the necessary expenses to continue the railroad agent to-morrow, at an expenditure of six dollars, be assumed by the Society. Carried.

Dr. Chapman moved the election of Dr. Hunter Robb and Dr. Donald Maclean as honorary members. On motion this was adopted.

List of Deceased: Toland Jones, London; Reuben A. Vance, Cleveland; Alexander Dunlap, Springfield; John Mack, Shelby, Richland County; J. Campbell, Galion.

The following delegate certificates were presented:

Columbus Academy of Medicine: D. N. Kinsman, T. C. Hoover, J. F. Baldwin, Frank Warner, E. B. Fullerton, J. C. Lawrence, J. C. Graham, W. D. Hamilton, F. W. Blake, T. W. Rankin, N. R. Coleman.

Cincinnati Academy of Medicine: C. A. L. Reed, Thad. A. Reamy, Amelia J. Prior, W. D. Porter, Rufus B. Hall, L. Freeman, N. P. Dandridge.

Union Medical Association of N. E. Ohio: A. B. Walker, Canton; Thomas Jackson, Canton.

Eastern Ohio Medical Association: J. S. McClellan, Bellaire; J. A. McCullough, Steubenville; A. H. Hewitson, St. Clairsville; J. A. Lindsay, Salineville.

Belmont County Medical Society: W. O. Huston, Bellaire.

Hempstead Memorial Academy of Medicine: O. C. Andre, Waverly.

Pike County Medical Society: J. L. Caldwell.

Mahoning County Medical Society: J. E. Cone, Youngstown.

Toledo Medical Association: S. F. Forbes, S. S. Thorn, O. S. Brigham, W. C. Chapman, J. W. Bond, G. A. Collamore, C. N. Smith, James A. Duncan, Thomas Hubbard.

The following Doctors of Medicine were recommended to membership by the Committee on Admissions during the course of the meeting, and were duly elected.

S. G. Adair, Beverly, Washington County Medical Society.
John B. Alcorn, Gallipolis (Gallia Co.).
L. O. Allard, Flat, Pike County Medical Society.
N. P. Barnes, Conly (Perry Co.).
J. L. Caldwell, Waverly, Pike County Medical Society.
J. W. Collins, Steubenville, Jefferson County Medical Society.
C. L. Crider, Zanesville, Muskingum County Medical Society.
J. F. Dorsey, Dresden (Muskingum Co.).
John Eakins, Patriot (Gallia Co.).
Peter Folk, Deaverton (Perry Co.).
Erskine B. Fullerton, Columbus, Columbus Academy of Medicine.
P. A. Gordon, Junction City, Muskingum County Medical Society.
Virgil H. Gue, New Lexington, Hildreth District Medical Society.
A. H. Hewitson, St. Clairsville, Belmont County Medical Society.
L. S. Holcomb, Pennsville.
J. B. Humphrey, Zanesville, Muskingum County Medical Society.
W. O. Huston, Bellaire, Belmont County Medical Society.
J. A. Judkins, Barnesville, Belmont County Medical Society.
C. M. Lenhart, Zanesville, Hildreth District Medical Society.
Jas. S. McClellan, Bellaire, Belmont County Medical Society.
J. A. McCullough, Steubenville, Eastern Ohio Medical Association.
J. G. McDougal, New Lexington (Perry Co.).
T. L. McQuaide, Cambridge (Guernsey Co.).
C. A. Moore, Cambridge (Guernsey Co.).
H. M. W. Moore, Columbus, Columbus Academy of Medicine.
N. E. Patrick, Zanesville, Muskingum County Medical Society.
C. M. Rambo, Zanesville, Muskingum County Medical Society.
T. L. Rosengrant, Batesville (Noble Co.).
L. Schooley, Belmont.
C. H. Stimson, Newark.
H. T Sutton, Zanesville, Muskingum County Medical Society.
C. M. Taylor, Columbus.
E. E. Vorhies, Cambridge.
Aaron W. Ward, Duncan's Falls (Muskingum Co.).
O. M. Wiseman, Zanesville, Muskingum County Medical Society.
J. H. Wright, New Lexington (Perry Co.).

The report of the Committee on Legislation was read. It advised endorsement of the Heinlein bill as reported in the daily press. This bill provides that suits for malpractice must be brought within one year from date of cause for action.

The report was received and adopted.

President's Address.

The scientific work was then taken up.

"The Treatment of Uterine Fibroids as Indicated by their Natural History," Dr. C. A. L. Reed, of Cincinnati.

"Some Remarks on the Total Extirpation of the Fibroid Uterus, with Illustrative Cases," Dr. Rufus B. Hall, Cincinnati.

Dr. Thompson requested that his paper, "The Effect of Obstructive Disease in the Upper Air Passages on the General Health," be read by title. Granted.

"Headache, Its Relation to Optical and Muscular Defects of the Eyes," Dr. S. C. Ayres, Cincinnati, and

"La Grippe in the Differential Diagnosis of Scarlet Fever, Measles and Roetheln," by Dr. James L. Tracy, Toledo, were also read by title.

"Total Extirpation of a Pregnant Myomatous Uterus, with Specimen," was then read by Dr. C. N. Smith, of Toledo.

The papers were then discussed by Dr. T. A. Reamy.

Adjourned.

THIRD DAY. MORNING SESSION.

Meeting was called to order 8:45 A. M., Dr. Dandridge in the chair.

Reading of the minutes by the Secretary.

The following papers were then read by title:

"Nephrectomy for Tuberculosis," Dr. R. Harvey Reed; "Multiple Neuritis," Dr. Joseph Eichberg. They were referred to the Committee on Publication.

Moved that where reprints are not requested none be furnished. Seconded. Amended that authors be notified of this regulation.

Dr. Dandridge: The usual number is fifty; anything above that is at the expense of the writer. That is the unwritten law. The motion was carried.

"Pneumonia," read by Dr. A. E. Bell, Zanesville.

"The Phenomena of Fertilization and their Bearing on

Heredity," Prof. J. Playfair McMurrich, Prof. Biology, University of Cincinnati.

Dr. John P. Sawyer: I move you, Mr. President, that we extend our thanks to Prof. McMurrich, and also to Prof. Kellicott, for these excellent papers on biological subjects.

Dr. Herrick: I wish to second the motion of Dr. Sawyer and express my appreciation of the paper. Carried.

"The Importance of Determining Reflex Irritation in Catarrhal Processes," Dr. Jno. P. Sawyer, Cleveland.

Dr. Sawyer's paper was then discussed by Dr. Sabin, Dr. Gray, and the author.

The papers of Drs. Tangeman and Aldrich were read by title.

Dr. Collamore moved that all the papers not here be read by title. Carried.

"Subcutaneous Osteotomy, with Cases," Dr. Willis W. Hall, Springfield.

"Multiple Gangrene," Dr. J. E. Cone, Youngstown.

"Some Practical Points in Ether Anæsthesia," Dr. W. D. Porter, Cincinnati.

"Trephining, with Report of Cases," Dr. Leonard Freeman, Cincinnati.

"Tonsillitis," Dr. J. H. Noyes, McConnellsville.

Minutes of the meeting read by the Secretary and approved.

The following resolution was presented by Dr. S. F. Forbes, Toledo, and its adoption seconded by Dr. S. S. Thorn:

Resolved, By the members of the Ohio State Medical Society that our thanks are due, and are hereby tendered to the members of the Committee of Arrangements, to the Arion Opera Company and to the people of Zanesville for their cordial welcome and the hospitable greeting which they have extended to us; and that the Forty-ninth Annual Meeting of this Society will be treasured in our memories as one of the most pleasant and successful in its history. Carried.

Minutes read and approved.

Adjourned.

THOMAS HUBBARD, *Secretary.*

Gordon, Thomas W.----------Georgetown.
Gordon, P. A.----------Junction City.
Graefe, Charles----------Sandusky.
Graham, J. C.----------Columbus.
Gray, F. C. ----------Dayton.
Green, Jos. H.----------Philo.
Gue, Virgil H.----------New Lexington.
Guerin, Z. F. ----------Columbus.
Haldeman, J. S. ----------Zanesville.
Hall, Willis W.----------Springfield.
Hall, Rufus B. ----------Cincinnati.
Hamilton, W. D.----------Columbus.
Hanna, C. U. ----------Columbus.
Hart, Samuel ----------Marietta.
Hatch, Charles A.----------Newark.
Hawk, P. W ----------Zanesville.
Hays, S. B.----------Kennonsburg.
Hemton, Peter----------Ansonia.
Hendrixson, H.----------Columbus.
Henry, A. Y.----------North Baltimore.
Herrick, H. J. ----------Cleveland.
Hewitson, A. H.----------St. Clairsville.
Hill, A. M.----------Cincinnati.
Hobson, J. A.----------Flushing.
Holcomb, L. S. ----------Pennsville.
Holcomb, C. B. ----------Corning.
Holmes, C. R.----------Cincinnati.
Holston, J. G. F.----------Zanesville.
Hubbard, Thomas----------Toledo.
Huggins, T. A. ----------Cambridge.
Humphrey, J. B.----------Zanesville.
Humphrey, Lee ----------Malta.
Huston, W. O. ----------Bellaire.
Iden, J. F. ----------Brownsville.
Jackson, Thos. W.----------Akron.

Jones, Thos. W.----------Columbus.
Jones, E. S. ----------
Jones, H. S. ----------Clarks.
Kohler, J. F.----------Quaker City.
Kellicott, D. S.----------Columbus.
Kendig, E. V.----------Hayesville.
King, F. J.----------Zanesville.
King, Chas. P.----------Newark.
Kurtz, C. E.----------Chicago, Ill.
Landon, C. P. ----------Columbus.
Larimore, F. C.----------Mt. Vernon.
Lawrence, F. F.----------Columbus.
Lenhart, C. M.----------Zanesville.
Lenhert, W. G.----------Columbus.
Lindsay, J. A.----------Salineville.
Lyne, T. J. ----------Stockport.
McClellan, J. S----------Bellaire.
McCullough, J. A ----------Steubenville.
McCurdy, S. L----------Dennison.
McDougal, J. G----------New Lexington.
McQuaide, T. L ----------Cambridge.
McTague, N. T----------New Lexington.
Maclean, Donald----------Detroit, Mich.
Martin, Jas ----------Fredericksburg.
Matthews, D. J.----------Zanesville.
Means, W. J ----------Columbus.
Melick, W. A----------Zanesville.
Merriam, R. K ----------Gaysport.
Metzler, A. S----------Baltic.
Miller, A. T.----------Shanesville.
Moody, J. A----------Junction City.
Moore, H. M. W----------Columbus.
Moore, C. A----------Cambridge.
Murphy, John A----------Cincinnati.
Naylor, J. B ----------Malta.

Norman, O. M.....Roseville.
Nye, H. S.....Zanesville.
Oliver, J. C.....Cincinnati.
Olmstead, D. S.....Millersburg.
Osborn, Mary E.....Canton.
Patrick, N. E.....Zanesville.
Peabody, Anna E.....Zanesville.
Pennell, W. W.....Fredericktown.
Peregoy, F. C.....Barnesville.
Peter, Rob't.....Canal Dover.
Porter, W. D.....Cincinnati.
Potter, N.....Adelphi.
Prior, Amelia J.....Cincinnati.
Probst, C. O.....Columbus.
Rambo, C. M.....Zanesville.
Rankin, T. W.....Columbus.
Reamy, Thad. A.....Cincinnati.
Reamy, L. M.....Zanesville.
Reed, T. J.....Massillon.
Reed, Charles A. L.....Cincinnati.
Richards, A.....New Lexington.
Robb, Hunter.....Baltimore, Md.
Rosengrant, F. S.....Batesville.
Ross, C. C.....Pataskala.
Sabin, T. M.....Warren.
Sawyer, John P.....Cleveland.
Sayer, Joseph.....Celina.
Schooley, L.....Belmont.
Schuzbach, J. C.....Strasburg.
Scott, X. C.....Cleveland.
Scott, Wm. J.....Cleveland.
Sinnett, E.....Granville.
Smith, C. N.....Toledo.
Smith, D. M.....Newark.
Smith, M. O.....Portersville.
Snyder, D. J.....Scio.

Southard, J. Q.---Marysville.
Spiers, H. H.---Ravenna.
Squires, A. W.---White Cottage.
Stamm, M.---Fremont.
Stein, G. S.---Columbus.
Stitt, J. J.---Frazeysburg.
Stone, J. N.---Hanover.
Stoneburner, W. A.---Roseville.
Straight, Howard S.---Cleveland.
Sutton, H. T.---Zanesville.
Tangeman, C. W.---Cincinnati.
Taylor, C. M.---Columbus.
Templeton, A. M.---Zanesville.
Templeton, B. F.---Zanesville.
Teters, B. F.---Middlebury, Ind.
Thompson, J. A.---Cincinnati.
Thorn, Samuel S.---Toledo.
Townsend, F. W.---Columbus.
Trickle, E. Hamilton---Cutler.
Trimble, C. E.---Crestline.
Vorhies, E. E.---Cambridge.
Walker, Geo. W. W.---Roseville.
Walker, A. B.---Canton.
Wallace, John---Deersville.
Ward, O. W.---Duncan's Falls.
Wellons, J. W.---Barnesville.
Wellons, G. S.---Barnesville.
Whitmar, J. E.---Millersburg.
Wiseman, B. M. S.---Zanesville.
Wood, Wm. H.---Smithfield.
Woodbridge, John Eliot---Youngstown.
Woodruff, L.---Alton.
Wright, J. W.---Columbus.
Wright, J. H.---New Lexington.
Yarnall, F. H.---West Lafayette.
Young, D. H.---Chicago.

N. PENDLETON DANDRIDGE, A. M., M. D.

Dr. Dandridge, the retiring president, was born in Cincinnati, April 16, 1846. His father, Dr. A. S. Dandridge, was a prominent figure in medical ranks for many years. He was graduated at Kenyon College, 1866, and entered the Medical College of Ohio the same year. Two and a half years were spent in study in Vienna and Paris, and he was graduated from the College of Physicians and Surgeons, N. Y., in 1870.

In 1872 he was appointed Pathologist to the Cincinnati Hospital. This was at a time when the holding of an autopsy was surrounded by the many discomforts which served to heighten the zest of the earnest worker. Pathology had not asserted its claim to an important position in the medical curriculum. The profession of to-day honors those who aided in giving it due prominence. The mortuary was then one of the subterranean rooms unavailable for other purposes. Examinations had to be conducted on short notice and at all hours. The recording of notes, preparation and cataloguing of specimens demanded a great amount of time and labor. This work, in which he was aided by Dr. Mackenzie, the associate pathologist, laid the foundation for the Museum of the Hospital, now very valuable to teacher and student.

The clinical use of the microscope had been acquired by comparatively few, and in this field especial service was rendered to the profession. This early training and the studies connected therewith laid excellent foundation for the successful career in the field of surgery.

In 1880 he was elected to the surgical staff of the Cincinnati Hospital. A continuous service of twenty-four years ranks him as one of the oldest members of the staff. In the same year he was elected to the chair of Genito-Urinary

Surgery in the Miami Medical College, and two years later he succeeded Dr. W. H. Mussey as Professor of Surgery. A year ago he was chosen Dean of the Faculty.

Dr. Dandridge has always been identified with the best interests of medical education and society work. He was one of the charter members of the American Surgical Association. His zeal and professional courtesy have likewise contributed largely to the success of medical organizations of the city and State. A judicial mind and unvarying disposition to treat every question with most perfect fairness, are prominent traits of his character. Innate professional dignity and love of harmony have often prompted him to concessions. This disposition, combined with firmness and a courage that knows no compromise with what is unprofessional and unfair, wins the admiration and affection of his colleagues and competitors. In his relations with younger men a considerate attention and regard for opinions less matured than his own has been conspicuous. These qualities combined in a cultured mind, and being gifted with rare social instincts, have served to endear him to a large circle of friends and associates.

E.

In Memoriam.

ALEXANDER DUNLAP, A. M., M. D.

By J. C. Reeve, M. D.*

Alexander Dunlap was born in Brown County, Ohio, on the 12th of January, 1815. His academic education was acquired by two years' study at Athens, Ohio, and by two years at Miami University at Oxford, Ohio, where he graduated in 1836. He read medicine with his brother, Milton Dunlap, at Greenfield, Ohio, and attended lectures at the Cincinnati Medical College, where he obtained his medical degree in 1839. He then entered upon practice with his brother, but moved to Ripley, Ohio, in 1846, and to Springfield, Ohio, in 1856, where he resided until his death, which took place February 16, 1894. . . . . .

During his career Dr. Dunlap performed, as stated by his son, four hundred and twenty-eight abdominal sections, of which sixteen or eighteen were hysterectomies, with eighty-three per cent. recovery. But it is his early work which most deserves consideration, and the time at which it was done and the circumstances under which it was performed should ever be kept in mind. Preceding him in the operation were McDowell, thirteen cases, and one case each by Nathan Smith, 1821; Alban G. Smith, 1823; David L. Rogers, 1829; J. Billinger, 1825; J. L. Atlee, 1843. But more influential as to the progress of the operation were the fail-

* Read before Am. Gynæcological Society, Washington, D. C., May 31, 1894.

ures that had been experienced, all of them in the best surgical hands of the United States, and among the operators several who had been successful. Thus there were failures and abandoned operations by Nathan and by Alban G. Smith, by Gallup, Trowbridge, Mussey, Billinger and Warren, of Boston. Of all this Dr. Dunlap at the time of his first operation knew nothing except the bare fact that McDowell had operated successfully. It is doubtless well that he did not know of the failures. He did not know what Atlee had done any more than Atlee knew of what had been done by Clay in the latter half of 1842. Publication did not then follow operation as meat follows grace. Seven years elapsed between the performance of McDowell's first operation and its publication! . . . . . .

Dr. Dunlap prepared a paper for the Ninth International Medical Congress which convened at Washington in 1887. It was on the *Early History of the Revival of Ovariotomy* and was published in pamphlet form. In this he gives a graphic account of his first case, his anxieties as he pondered the case, and his hesitation in undertaking it. He recognized, after several tappings, the nature of the tumor. He knew that McDowell had successfully removed such tumors, and that was about the extent of his knowledge. He sought in vain for information as to the different steps of the operation or as to what difficulties he might meet with in the attempt. Journals were few and books not accessible to him in those days. "I was as one in the dark, with no one to bring me a light. I was alone, with no one to advise me." These words reveal a situation difficult to realize now. Fortunately Dr. Dunlap had a patient of no ordinary mold. She urged him to undertake the operation, although there was no anæsthetic to save her from suffering, and she took upon herself all the responsibility in case of failure. This heroism recalls that of the young woman who submitted over and over again to operation by Marion Sims and upon whom he established the operation for vesico-vaginal fistula. The names of these humble women have passed away;

their memories deserve a tribute from those who practice or who profit by improvement in surgical methods. Finally, the operation was performed on the 17th of September, 1843. The patient did not reap the reward she deserved; she died on the twentieth day, from what cause does not clearly appear. Dr. Dunlap did not operate again until 1849, and this second operation was also done without an anæsthetic.

Attention has been directed perhaps too exclusively to the operation which he aided so much to establish, but Dr. Dunlap did some very good surgery in other lines. Once he removed the entire clavicle, three times the inferior maxillary and removed a stone from the male bladder which weighed twenty ounces.

Dr. Dunlap was a member of the American Medical Association; he was twice elected one of its judicial council and served as one of its vice-presidents in 1877. In 1868 he was elected president of the State Medical Society of Ohio. He was made a member of the American Gynæcological Society in 1877, but his name was placed among the honorary members some years before his death. He was also an honorary member of the American Association of Obstetricians and Gynæcologists. From 1874 to 1885 he filled the chair of Gynæcology and Surgical Diseases of Women at Starling Medical College, Columbus, Ohio.

The latter years of his life were years of suffering, but he lived long into the feebleness of age, and he twice underwent the operation of lithotripsy at the hands of Dr. Dandridge, of Cincinnati.

Two members of his family survive him, Dr. C. W. Dunlap and Mrs. Mary E. Hamilton, both of Springfield, Ohio.

TOLAND JONES, M. D.

Dr. Toland Jones, of London, Ohio, died February 18th, 1894, at his home, aged seventy-four years. The cause of death was pneumonia. He was born January 10th, 1820, in London, Ohio. At the age of twenty he left the farm and entered the preparatory department of Granville College; and after two years' study there, he began the study of medicine under the direction of Dr. Aquilla Toland. In time he took his first course of medical lectures in the Ohio Medical College, and received his diploma from the Cleveland Medical College.

In 1862 he left his lucrative practice and enlisted as a private, but soon was appointed captain of Co. A, 113th O. V. I., which position he held until June, 1864. He was called to the command of the regiment at the battle of Kenesaw Mountain, in absence of Lieut.-Colonel D. B. Warner. Colonel Jones participated in the engagements at Chickamauga, Knoxville, Rocky Face Ridge, Resaca, Kenesaw Mountain, Dallas, Peach Tree Creek, Jonesboro, Savannah, Averysboro, and Bentonville. It is said that in the battle at Jonesboro, General Gordon of the rebel army surrendered in person to him. He was on that grand historic march with Sherman from Atlanta to the Sea.

At the close of the war he resumed his interrupted professional work. He was sent to the Ohio Senate the next year. He was chosen presidential elector in 1888, and was a member of Gov. Foraker's staff.

Dr. Toland Jones was loyal to the State Society, and was President of the Central Ohio Medical Society.

Dr. Jones was united in marriage with Frances, daughter of Dr. Aquilla Toland, March 10th, 1846, who with three daughters survives him.

G. M. C.

REUBEN ALESHIRE VANCE.

Doctor Vance died at his home, No. 298 Prospect street, Cleveland, Ohio, Monday morning, March 19, 1894. He was born at Gallipolis, Ohio, Aug. 18, 1845. At a joint meeting of the Cleveland and Cuyahoga County Medical Societies the following resolutions were adopted, a brief, sincere expression of the high position held by him in the professional ranks and in the hearts of his colleagues :

"WHEREAS, Death has removed from our number Dr. Reuben A. Vance:

"*Resolved*, That by his death the medical profession of Cleveland has lost one of its most eminent and useful members, and the medical societies one of their most active and earnest workers in promoting the scientific interests and progress of the profession."

The following resolutions by the Rowfant Club suggest the broad character of his culture and literary attainments:

"Having heard with sorrow and regret of the death of our fellow-member, Reuben Aleshire Vance, on Monday, March 19, we are met together to express in a feeble way our deep sense of loss and our respect for his memory. A ripe scholar, a diligent student of literature, a fond lover of books, and deeply interested in the welfare of his fellow-man, he combined in a rare degree those qualities which drew him to this club early in its history and made him a valued and distinguished member. Salient among the features of his essential virile character was the passion for truth which marks a scientific mind, and with philosophic composure he has departed to its complete revelation."

ADDRESS OF WELCOME.

E. C. Brush, M. D., Zanesville.

Mr. President, Ladies and Gentlemen: It is a great pleasure to say welcome to this Society upon its return to Zanesville after a pilgrimage of thirty-nine years. At the previous meeting, held here in 1855, Dr. G. S. B. Hempstead, of Portsmouth, presided, and Drs. W.W. Dawson, of Cincinnati, and Charles C. Hildreth, of this city, were the secretaries. All of these men have answered the last call. All of them became distinguished in their respective walks of life. Doctor Hempstead's memory is cherished in his old home with love and reverence. Doctor Dawson made a world-wide reputation as a teacher of surgery. Doctor Hildreth was the typical medical gentleman. His character and career are worthy of emulation. His name and memory will always live in this community. The *personnel* of this Society has almost entirely changed since that meeting, and it is with much pleasure that we greet some of the same men to-day who were here then.

Great changes have also occurred in the theory and practice of medicine. At one time this Society lost many of its members, not because they lacked interest in their profession, but because they were following the flag on the field of war. It is with pride that we younger men point to the records made by our older members in the days of '61-5. With some local pride we refer to the fact that the first physician to offer his services to the governor of Ohio, in

1861, was the late Dr. Alfred Ball, of this place. Among others who rendered distinguished service, was the late Dr. Howard Culbertson, who in 1862 was by this Society awarded the prize for the best essay on the use of anæsthetics in obstetrics, and also author of the prize essay on "Excision of the Larger Joints," presented to the American Medical Association in 1870.

Wishing to commemorate the memory of our men who died in the service during the Rebellion, our county has erected this building. On behalf of the board of gentlemen who hold it in trust I welcome you to these halls. The names of our soldier dead are hung upon them. You who served with these men know full well how they suffered and how they died.

There is every reason to believe that this meeting will be of *unusual* interest, and along with that let me assure you that your welcome is an unusually warm one. We hope that our hospitality and our interest in your welfare will so impress you that your next pilgrimage will be a short one, and that before very long we can again throw open the gates of our city and the doors of this building to you.

PRESIDENT'S ADDRESS.

N. P. Dandridge, A. M., M. D.

My first impulse is to express to the Society the high appreciation I feel for the honor conferred upon me in being selected to preside over this meeting. This honor, gratifying as it is, necessarily brings corresponding responsibilities, not the least of which is to furnish an address worthy of the occasion, and which will justify taking so much time from the instructive papers which you are naturally anxious and eager to hear. The work necessary for the preparation of such a meeting is full of interest and instruction. It has necessarily brought me in closer contact than ever before with the active workers all over the State, and has certainly given me a broader and clearer insight into the forces and motives which underlie our professional work, and I have been more and more impressed with the strength and importance of the State Society, and the important place it holds in maintaining the present standing and determining the future development of the medical profession, and of its large capacity for good in the general advance in every direction.

The period of development and preparation for this meeting has not been entirely uneventful, and our course has not always been on smooth and unbroken waters. Differences of opinion have been encountered, and the very energy of their expression has been certain evidence of the interest felt, and the importance attached to our Society work. To all those who have held different and contrary

opinions, I have given full credit for the same singleness and sincerity of purpose of which I have been conscious myself —a singleness of purpose which finds its highest expression in working for the best interest of the Society as each one understands it.

I should have preferred to present some evidence of my own professional experience, however small and insignificant it might be, but custom seems to exclude all individual work from the presidential address. I shall, therefore, confine myself to some few thoughts which seem appropriate to the time, and some few suggestions on the lines in which our work may be broadened and advanced.

The influence which is exercised by a meeting such as this is manifold. To the outside public and the profession at large it gives an opportunity of judging of the attainments of its members, the strength and character they possess, and the influence they are likely to exercise from a well-defined and united purpose. On its members it exercises an important influence on the elevation of professional character and the protection of professional interests, and in the advancement of professional attainments.

It should seek to elevate and develop character, while it instructs and educates. Its meetings should be the field for all that is new and sound and good, and its contests should be the training-school in which are developed the thews and sinews of intellectual life. The organization of this Society should be such that it could concentrate and formulate its opinions and wishes— not only at its stated annual meeting, but at any time during the year. We should recognize the fact that the function of a State Society is to bring within one organization all those who are earnest workers in medicine, not only that they may instruct themselves, and instruct the community in matters pertaining to life and health, but to exert the influence of united effort in furthering all that is manly and good, and in opposing all that lack these essentials in whatever departments of life they may be found. Medical men are too prone to hold

themselves as somewhat apart from the rest of mankind – as a guild separate, and to some extent defiant of the rest of the community—as "God's very elect" among men on account of their labors of charity and love, and we are too much disposed to hold ourselves above both comment and criticism, and to resent being weighed by the common standard, in common scales. "My full sympathy is with the view that the ideal physician is the man who lives least in his professional groove, whose attention is least devoted to one class of considerations, and who has least sunk the man in the profession." This Society should throw its full strength and influence into all those movements which affect the doctor in his social or professional life, and we should not hesitate to make known our ability and determination to punish as well as reward. The general State Society must, to a large extent, rest on local organizations, but if it is to rise to the full purpose of its existence, and to represent the interests of the whole medical profession of the State, it must open its doors in friendly welcome to all those doctors within our borders who are possessed of an earnest spirit in their professional work. If this Society is to play its role as an active, compact organization, it must be composed of a well-defined and definite and permanent membership which continues from year to year. Much of the charm, and most of the influence, of these meetings is the prospect of meeting those we have known before. It should be the body in which all its members have their place, and it should be large enough and strong enough to send its life-currents coursing through the veins of all. But a few years ago the life of doctors was much the same, and the development of their ideas and feelings and sentiments took place through much the same environment and experience, and in failure, or success, they came in contact with the world at large through much the same points of contact. Now it is different, and doctors lead most different lives, and are developed under most diverse and different conditions. The specialist, in his well appointed office, with his definite time of labor

and his hours of undisturbed rest to be employed as his tastes and inclinations may direct, can hardly enter into the feelings of those who must hold themselves in readiness to answer summons in any hour of the twenty-four. The laryngologist, his professional life spent in a darkened room, his vision limited to the focal length of his reflecting mirror, and his eye confined to the illuminated spot resembling in size the gold piece which will be the reward of his skill and dexterity, is not likely as time goes on to fully understand the man in general practice who passes from stone front to shanty, from alley to suburb, and who turns from measles and whooping-cough to gout and broken bones.

Both are doctors, doing their work within the limits in which personal preference, or accident, or chance have thrown them. This entire difference of condition and surroundings must surely have its effect upon the feelings and sentiments and character of the future man of medicine—and there will be doctors and doctors. When the medical animal of the future has fully reacted to his changed environment, he must present great variety of temper, form and coat, and great diversity in the length and sharpness of claw. The professional character of to-day, its feelings and its sentiments, have been largely developed under the old-time similarity of work, and there is already indisputable evidence that the present phase of professional life finds itself ill at ease with many of the ideas and customs of the old regime. I hold it to be one of the most important functions of the State Society to prove a common resting-place for all this great diversity of work and interest, and that the greater body should attract all the lesser with such binding power as to counteract the centrifugal force which tends to send them further and further apart. The advisability of dividing the Society into sections which shall represent the various specialties, which have given such undoubted impulse to modern medicine, is likely to present itself with urgent force—indeed such a step has already earnest and able advocates. The creation of such sections would, to my

mind, be an undoubted misfortune. It is largely, I conceive, the especial province of such a general Society to hold bound together the various departments, now so much disposed to drift asunder, and it is, I believe, for the interests of all that our work should be done in common session. The papers which are presented on special topics certainly must exercise a wider influence when read before the large general meeting, than when presented to those who are nearly, if not as fully informed upon the subject under discussion as the essayist himself. Indeed it should be the aim in the arrangement of every program to see that a sufficient diversity exists, so as to include a wide range of special topics, and the oculist and aurist and gynæcologist will speak with an authority, and command an interest before the general meeting they could not obtain when addressing specialists alone. The division into sections will certainly weaken the force of the meeting as a whole, and will greatly add to the difficulty of organization. I must believe that the duty of this Society to bring together a full representation of the profession from all parts of the State, and to combine all the phases of professional work, will be better conserved by the general meeting than by division into sections for the scientific work. We come together once a year to see each other, to hear each other, and to know each other, in our different lines of work, and to become familiar with that personal tone and character which can only be done by personal contact; and certainly the interest is more and more enhanced by greeting year after year those in whom we have found congenial traits and tastes, though developed under conditions of professional life entirely different. The mere abundance of material may at times necessitate a separate meeting, but even this is to be avoided if possible.

The constitution indicates that one of the definite purposes of the Society is "the promotion of all measures adapted to the relief of the suffering, the improvement of the health, and the protection of the lives of the community." In furtherance of this object, which we should consider bind-

ing upon us, we can most surely accomplish this purpose by drawing in close sympathy with those bodies created by the State for the preservation of the health and lives of its citizens. As individuals in the pursuit of our professional work in the communities in which we live, we come in contact and should support the local Boards of Health, to whom is entrusted the care of limited areas. As a State Society representing the working force of the entire State, we should seek to establish the fullest harmony and closest relation to the State Board of Health, and if we are to do our part in the great organized effort for the prevention of disease and the protection of the community, we must be prepared to furnish them the eyes, and ears, and hands which are needed for their work. The full accomplishment of such a purpose comes only by the establishment of that perfect accord of action which springs from mutual sympathy in common work. The general health and happiness of the State is the aim, and we should surely stand ready and willing to respond to all just demands in so worthy a cause. Our individual experience is of necessity limited in kind and degree; our collective experience can furnish the data from which wide-reaching deductions and definite conclusions can be drawn, which must result in a larger knowledge of the conditions under which health may be preserved and disease prevented—knowledge, the dissemination of which among the community at large must precede any efficient effort for sanitary reform which looks to prevention. It is surely the duty of this Society to teach the propriety of ready compliance to the just demands for that information which we alone can furnish, and to lend its influence by precept and example to induce its members to promptly furnish whatever aid the State Board may require in its work. The work of our State Board of Health since its organization has been largely one of enlightenment and education, and not the least difficult to reach in this respect have been the physicians themselves, who have only too often impeded progress by manifest indifference, or have offered a captious

opposition. Their progress has been definite and sure, and under the inspiring influence of the central Board local Boards have organized throughout the State, and are doing valuable work in the collection of vital statistics, and disseminating a knowledge of the manner in which disease is spread, and so taking the most effective step in its prevention. We certainly can do much here and at home to strengthen and uphold their hands, and to encourage them in their most useful work, and in no way can we contribute more largely to the public good. The annual meeting of this Society would seem to be a fitting place for the State Board to develop and explain its future plans, and it would certainly seem to be their duty to bring to our knowledge the extent and condition of any prevailing disease, or to point out the approach of any impending epidemic. For the past few weeks the report of scattered cases of smallpox in this and other States has given ground for alarm lest an epidemic more or less general might break out. No more important communication could be made to this Society than a brief bulletin, stating the present condition of the disease throughout the State, its tendency to spread, or the evidence that it was on the decline. The Society could, I should think, undertake at the suggestion of the State Board from time to time the study of some definite question affecting the public health or welfare, by means of a specially appointed committee, and we should always be ready to use our influence to obtain such proper legislation as occasion may require for their use. I consider it a good omen for close union in the future that at this meeting a representative of the Board gives us the benefit of his studies and experience in so important a subject as the prevention of tuberculosis, and his views will doubtless reflect the purposes his Board has in view in this direction, and I hope in the future no meeting will pass without a like contribution being made. We can certainly be mutually helpful, and we should feel that we are mutually dependent on one another. That such a natural relation should exist, mutual

confidence must be established. The State Board of Health should feel that they can rely upon us for the furtherance of their work, and at the same time while they turn to us as their natural allies and supporters, they should recognize that the members of this Society constitute the highest court to which they can appeal for the correctness of their aims and the efficiency of their methods. Working together in this way, the influence of the medical profession on the community must be enlarged, and the dignity of our work greatly enhanced.

The time is past when the few years spent in the medical school could possibly furnish all that is necessary in a medical education. We must look to the schools and universities, with their laboratories and instruction in chemistry and physics and biology, for a large part of the essential training necessary for the more special study of medicine. The oculists need optics; the aurists must understand acoustics; electricity and magnetism are inseparable from the work of the neurologist, while physician and surgeon must base their work on the larger teachings of biology, and I consider that one of the chief titles of this meeting to recognition will be that we have representatives from two of the foremost universities of the State, who have favored us with their presence and have thought this a proper occasion on which to address us upon subjects within the range of their biological work. The interest with which these papers have been awaited is an evidence of how strongly this view has met with common assent. This example I trust will continue to be followed, and that future meetings will always attract similar contributions from those who are able to devote their time and energies to broad scientific pursuits, even if their results do not seem at once to apply to and be available for our own practical work. If medicine is to maintain its position as one of the learned professions, and we are to have anything more than mere rule-of-thumb doctors, we must recognize our dependence upon those institutions in which these essential subjects are taught. The doctor of

philosophy will be largely responsible for the philosophical doctor of the future.

I am painfully conscious that the fragmentary suggestions I have made are incomplete and unsatisfactory, but I trust they may contain some active germs that will grow to some degree of usefulness, and I cannot end my address without expressing the strong conviction that the coming years will find our State Society growing in strength as it grows in age and numbers, and that its aim will continue to be to extend its work in whatever direction it can to develop the science of medicine, and in whatever manner it can help to broaden and ennoble the character of those who pursue it as a profession, and in whatever way it may prove of benefit to a suffering humanity.

THE DOCTOR.

(A CRITIQUE.)

BY SAMUEL HART, M. D., MARIETTA.

The general practitioner of medicine has need of an honest fair-minded interview at the hands of his compeers, with a written report to date. The public should be invited.

The doctor has been, and is, regarded too much as an indefinite commodity; with title, professional claims, and exact functions poorly defined. When one is sick or injured, a doctor is called, and charged with the responsibility of restoring the patient; this he does with alacrity, or "cures him" until he dies. In either case the community is divided as to whether the doctor was the right man in the right place, or whether he was entitled to any professional place; or, indeed, if he was not a proper object of censure or even of legal prosecution for malpractice.

As to title, that of *physician* is distinctive and appropriate, while that of *doctor* is more popular and generally applicable. It is ancient, classic, and its M. D. has an honorable association with D. D., LL. D., &c. There is in it, however, no guarantee and no trade-mark. It is appropriated by the mountebank, the brazen pretender, and the Doctor Corns.

Medicine, as exponent of doctor, has had a strange evolution along the centuries; but let it be left to the patient historian to linger and smell the mal-odorous ointment of the

apothecary, and to note the association of medicine with the superstition, priestcraft, and astrology of the past, and consider how much these remain in some modified form as an opponent of true medicine of the present day.

Notwithstanding the great advancement of modern medicine toward scientific exactitude, there remains among its votaries numerous sects and creeds, of singularly clannish pertinacity of adherence to dogmas, theories, and practice long since controverted by science. The so-called regular school of medicine had a trying time in undoing its faith in certain rules and principles of the fathers, and in numerous panaceas which had been, as it were, an incorporate part of the doctor, or which were his ever ready weapons in conflict with disease.

In times when the blood was the seat and source of innumerable vile humors and deadly stagnations, what could be more practicable than to drain it off, freely, and in the sand, even *ad deliquium*. This bold treatment was popular, and certainly impressive. But later, when the blood of better breeding was found by patient provings to be less vicious, the lancet-man withheld the little blade, although with seeming reluctance, as if disarmed and vanquished. It was well when he fully accepted the lesson and hastened forward upon new vantage-ground, unbound of error. Expanded views, tolerance, and fraternization follow such honest confessions. The doctor of another, more modern creed, is being dragged to his confession under pressure of uncompromising science and even of popular demand. He slowly relinquishes his hold of faith in his prophet and priest (who was an *alien*), and drops his cipherings for "potencies," for want of time and space for his figures. He, too, acknowledges diseases have changed, and that under positive demonstration *scabies* has become more gross and tangible; that it is no longer the ubiquitous, diabolical prime cause of all disease, but that simple *Sulph. Sub.* has proven its infallible exterminator, provided only, it must be honestly and intimately applied, in order utterly to de-

stroy and stamp out the infernal parasite. Positively no attenuations or dilutions are allowable. Perhaps the beautiful theory of "similia similibus" is illustrated in infernal *brimstone* for infernal scabies. Homœopathy is evolving; becoming less and less attenuate in theory, and more honest in practice.

Eclecticism has evolved. It is the child of Ek-lek-ti-kos and Thompson. Formerly a doctor was at liberty to select from the entire known list of remedies with perfect freedom and common ownership. Later the eclectors appeared; first in the fields as indicated by nature; then in the shops, electing and purloining a few simples from the universal list, leaving anathemas for the remainder. Upon the bloodroot, jack-in-the-pulpit, the warm capsicum, the coptis or gold thread, the beautiful hydrastis Canadensis, et cætera, they erected a sect, and hung their sign-board and title; and to this day claim to be honest discoverers and founders of an improved practice. It is believed eclecticism is evolving, and that its leaders are becoming more content with the honorable title doctor, without prefix or suffix. There are other peculiar practitioners of peculiar methods, too numerous to mention. Let them all make haste to conform their *credo* to a common name, and the universal base for all medicine, namely, anatomy, physiology, chemistry and pathology, leaving the field of therapeutics broadly open for all! But wait: the medical millennium is not at hand. The public and society are concerned. Here there is no consensus, but only chaotic diversity and perversity of medical belief. There is a good majority of hard-headed people who are devoted to science, art, mechanical and objective things. They believe in the human body as human, fragile, and mortal; and that to insure its longest continuance in perfect healthfulness, symmetry and excellence, requires man's best knowledge of its constitution, functions, and necessities. They do not vaguely confuse undying spirit with most changeable matter, but hold as a dominating fact that the mind with its various faculties is intimately associated with,

and dependent upon, the physical condition of the body, so that the sound mind in the sound body is largely in the keeping of the doctor. Then, there are many persons who seem mentally astigmatic and strabismic; facts seem distorted, and the laws of nature distasteful and groveling. They live in an atmosphere of paranoiac sublimity. They erect altars "to the unknown"; they anticipate bodily translation while still retaining a hearty grip on earth; and mistake an earthly borborygmus for the afflatus of their expectancy. These persons resent a suggestion of catharsis or enteroclysm as a mortal offense. There is, however, for this class, a place of temporal rest, provided by specialisms suited to their peculiarities and their pecuniary preferences. In fact, there are medical creeds and doctors to suit all sorts and conditions of men — and women.

The time of unification of medical creeds and practice, waiting upon the demands of a *medically intelligent world*, is not definitely forecast by the signs of the times; and while it is the duty of the doctor to hasten that time, he will take a practical view of the situation as a professional guide.

The flourishing redundancy of the tree of medicine has within a lifetime developed certain branches of great attractiveness and surprising fruitage. These are anomalous; they are acephalic and eviscerate, except as they are a part of the medical tree; while in their differentiate unity with it, there is represented a grand epoch in medical progress; these are the specialisms. But the *doctor* must have an *individuality*; and there are no well-defined lines between himself and specialisms except those of general good neighborhood. Some landmarks in this regard may be considered later on.

The division of the broad subject of medicine was found a necessity, and gives universal satisfaction. The apportionment of the human anatomy among the many claimants has been made by some rule of thumb, and the territory staked out in claims, with borders so sinuous and continuous as to require a chart with measurements of precision; and only innate honor (of course without reference to code)

makes it possible for them to keep up their arachnoidal lines with amicable precision. The general practitioner has fully accepted the change, and is no longer jealous or disconcerted. He notes with admiration the extraordinary facilities of the specialist in the way of full equipment and with trained support; the admirable skill in diagnosis; a dexterity in operation, and the exquisitely sensitive technique acquired only by long practice under the most favorable circumstances. Then the special senses become amazingly acute, and the *tactus eruditus* becomes an enviable possession. The success and conspicuity of specialism has prompted to singular and not only "irregular," but ludicrous imitations. Let the doctor briefly review such an one. A certain claimant being driven to the wall by unfriendly competition, has discovered and pre-empted a claim in the wilderness, as it were; narrow, and seemingly forbidding, and which he claims was practically fallow; but when developed by art and perseverance, proved to be a veritable bonanza—a source both of gold and glory. Here upon the orificial indicator every jarring note of pathologic discord, however distant, is legibly recorded. Furthermore, and better: the discoverer and operator has only to put the key-board in order, *secundem artem*, when, if anything further should be required, the suffering part may be reached through its afferent filament and brought back into perfect unison and harmony. This pre-emption claim, trade-mark, and all rights are reserved, and notice served that nasal, aural, oral, and vulvar places are not orificial. This discoverer is a shrewd observer of the popular pulse and requirements; and many *very* intelligent people are glad and boastful recipients of the magic touch of the analogist.

The doctor of our title and text has an environment of more intimate and vital interest than that of the creeds and specialties, viz., the druggists, pharmacists, and proprietaries. These medicine-men show a very friendly interest, and a disposition to assist the doctor, and render his wearisome duties lighter. They are the owners of the entire stock of

everything called medicine, including the infinitesimals, the nitro-glycerine of the regulars, and every gradè of alcoholics, narcotics, deleriants, seductives, and preventives; and all the proprietaries, as well as the improprietaries. And this omnibus arsenal is fronted and flanked by beautiful fancy articles, sweet perfumes, flowering plants, singing birds, and everything tasteful, artistic, and attractive.

The doctor is cordially welcomed there; but, let him remember, only as a customer, for the Drug Trust means business. Frequent and liberal prescriptions and orders are duly credited up to the doctor, as against numerous and equally valuable favors in the way of good words, and a share of patronage which is at the disposal of the druggist to be dealt *pro rata* among his clients, the doctors. The Drug Trust is custodian and practically owner of all the favorite formulæ of the doctor which are to him valuable personal property, and represent some of the best efforts and experience of his life. These may be held as hostages to insure continued loyalty, and as recorded data for distribution of perquisites. The Trust appreciates a popular prescription, for it continues to return for "refilling;" not only for the first patient, but for many friends and relatives, male and female, who are "exactly like" the No. 1. These prescriptions are often gold-bearing bonds, given, as it were, in perpetuity; and somebody clips the coupons as a perennial harvest. . . . The doctor may hastily advise the use of "paregoric," for some child trouble; the mother may give some inert drug, or a mistaken one of dangerously high concentration; or, more likely, she carries the case to the druggist, who listens patiently, prescribes, and furnishes a pleasant substitute. He will say kindly, "Come again," and the mother continues to come again until the child becomes the adult confirmed morphiomaniac; continuing to come with increasing frequency, and the urgency of desperation. The doctor had practically told the mother not to trouble him with questions so simple; and that she should keep a supply of home remedies on hand, and to administer them

as best she could. Such inadvertence permits very many lives to be made miserable, encourages counter-prescribing, and the home and neighborhood tampering with doubtful or positively dangerous drugs. Besides, it is a practice pecuniarily suicidal, and deserving of professional censure. The unlimited "refilling" of unindorsed prescriptions is directly responsible for a deplorable amount of alcoholic and narcotic habit, which is induced insidiously by chronic medicine-tippling. If a full exhibit of the mountain of human misery brought about through this training could be made, there would be a public awakening and indignation; but in it the doctor would be held as *particeps* much less frequently than at present.

The immense power of the nostrum and semiproprietary trade is directly the possession of the druggist. It is the disheartening opponent of all honest and intelligent practice. It is an insidious but mighty incubus upon the people, comparable only with the nefarious business in alcoholics direct. This is no attempt to make war upon the legitimate drug and pharmacy business, for it is essential, helpful, and convenient, and is abundantly able to take care of itself; and if in doing so it will take safe and wholesome care of the public interests in its keeping, it will be understood and appreciated as a good Trust. The doctor will preserve a strictly professional autonomy under difficulties. He is on the defensive against the antagonism of numerous creeds; the popular demands for new and startling cures and plans; the omnivorous craving for pills, the spring renovator, and the safe kidney bug. Then there is a wasteful and unwarranted amount of gratuitous public service rendered at the dispensaries to a class of chronics who are abundantly able to pay. The universal, kind, but dangerous advice-giving by the laity is to be deprecated. Last, but not least, from the very nature of things, the public press is adverse to regular, conservative, non-advertising medicine. The immense nostrum business, the disgraceful and mendacious irregular advertisements covering acres of illuminated pages, must

command a friendly newspaper interest, and efficient lobbying power in legislation to prevent a clean and wholesome State regulation of medical practice.

But this is no pessimistic tirade. The case of the doctor is not grave, the prognosis is entirely hopeful, the prescription infallible, and of his own medicine; it is comprised in a single word, *merit — professional merit.* . . .

THE STATE UNIVERSITY AND MEDICAL EDUCATION.

By D. S. Kellicott, Columbus.

Prof. Zoology and Comparative Anatomy, Ohio State University.

In this assembly of professional men I am a layman, an outsider, present by your courtesy and possibly from the fact that I am an instructor in one branch of biology and in some small degree an investigator; the courtesy extended, I take it, is a recognition of the proposition that pathology, *i. e.*, pure medicine, is a branch of biology; therefore I may claim, at least, kinship in profession, and that I am one with you in the interest of a great science, perhaps I may say the greatest biological science.

In a sense I represent an institution that belongs to you, and my purpose is to discuss with you one feature of its work as laid down by the governing body; a feature which, it is thought, appeals especially to those of your profession, and I express the hope that it may call forth your views and helpful criticism. I shall speak first of those propositions or fundamental principles, in accordance with which the University authorities have arranged the course designed especially to prepare students for the successful study of medicine, and then of the course itself.

1. Thorough training is needed for real success in any profession or vocation. This of course no one here will dispute; indeed the truth of this is being yearly more and

more widely recognized. What can better attest it than that so many States, including our own, aided by the General Government, have established and maintain one or more public institutions with costly plants and with nominal tuition, where young people are thoroughly taught and disciplined for civil, mechanical, electrical, and mining engineers or agriculturists; and that most of these practical schools are filled to their utmost capacity with earnest, capable and worthy students. This means that the making of a modern master blacksmith requires one to pass the grammar and high schools and four years of as exacting college work as in any course in any college. And, by the way, General Walker, whose opinion in this matter should be carefully weighed, has said that "A good technical course produces better educated men in all that term implies than the ordinary college course."

2. The training which is to fit men to practice medicine should be especially thorough and many-sided. It is not only to prepare men to earn a living, but men who, by virtue of their training and opportunities are to be leaders in their respective communities, men who are to have, and may safely have in charge the lives and health of the people.

3. Therefore, the least that a State University should be permitted to do by way of direct preparation for this great responsibility is a sound preliminary discipline that has reference to the needs, methods and scope of the more strictly university studies of the professional school. This may be accomplished through the regular courses where pretty free electives are permitted, or by a briefer, special course with strict requirements, designed to bring the student out at a definite place with special fitness and qualities.

4. Medicine has rapidly advanced in recent years, as all biological, or more generally, all physical sciences have done. It is less empirical and therefore less independent than ever before; for, as Professor Huxley puts it, "It is a peculiarity of the physical sciences that they are indepen-

dent as they are imperfect; it is only as they advance that the bonds which really unite them all become apparent." So the enthusiastic naturalist, so long and so widely an object of good-natured banter as he is seen plodding up hill and down dale with net and dipping-bottle, exploring every nook and crag, clear stream and stagnant pond, has, at last, come to honor! Grave doctors of medicine must recognize in him a coadjutor for the noble service he has rendered in discovering the haunts and habits and life-histories of animal and plant parasites, frightful causes of disease and death. This plain, impractical lover of nature must be recognized as one who has done much to make known those simplest forms in which the mysteries of life and organization are almost unveiled and open to vision; and it is here that the mind of man approaches as near as at present seems possible to a comprehension of the principles on which your art is founded. The naturalist, or biologist, has certainly done much to discover and fashion the foundation stones of medicine.

5. It seems, therefore, to follow naturally that the healing art should be treated, from an educational standpoint at least, as a branch of biology, and that the understanding and interest in biology, its methods and its scope, should be broadened and deepened by proper instruction at the proper time, *i. e.*, in the academic course.

6. It appears from a recently issued report of the United States Commissioner of Education that the relative number of medical students who have acquired academic or scientific degrees is less than formerly. In other words, a larger number, relatively, enter upon medical training direct from the high school, or from the ranks of school-teachers, or from those who have failed to get on in some other vocation. In the same report it is shown that a majority of medical faculties agree that their students are as well or better prepared now than in former years, so, after all, it may be that the state of the case is no worse, but this is not enough. The difference between "well" and "*pretty* well" is very great.

The student's preparation for university studies ought to be "well." It ought to be *very* "well," for until students have special elementary training for the medical course, too much time in that course must necessarily be spent unprofitably on mere elements that should have been well in hand at entrance.

7. The time at present required to earn an academic degree in the American college is regarded by many educators as too long, at least as compared to the time required in the professional schools. President Hall would "Degrade the A. B. degree at least a year in the best colleges"; "Harvard tends toward a three years course"; whilst "Columbia allows a co-ordination of college and professional studies"; so it is a grave question whether it is not better, in the long run, to put more time on the professional training and less on the academic, especially so if the student enters upon his work late in life. To meet this question fairly the State University has instituted a three years course, the studies of which have especial reference to those that are to follow in the medical college. Moreover, for those who prefer the four years course in either science or letters, with the degree at the end, pretty free electives are allowed in the fundamentals of a medical course.

8. The doctor of medicine has magnificent opportunities for investigation in a range of questions of the highest importance. The annals of science attest their ability. No other profession, speaking generally, in this country, has equal incentives and opportunities; hence the scientific training from the first should be as far as possible in the laboratory and with the scalpel. The younger the brain and nerves and muscles when they begin to direct instruments of precision, the greater the skill and conscientiousness in the pursuit of truth in after-life; the greater will be the ambition and the broader the foundation to leave one's profession better than he found it.

To enter the course preparatory to the study of medicine at the State University, a student must be seventeen years

of age and have completed the equivalent of the average high school course in English; it is practically what is now required to enter the Engineering and Agricultural courses. No language other than English is required.

The course requires three years, with an average of nearly seventeen hours per week through the academic year, or about 1800 hours; his time is divided among the several groups of subjects as follows: Foreign language, 432 hours; English, 124; physical science, 318; biological sciences, 656; and the balance upon several subjects designed to make a man a good and strong citizen. In addition military drill is required one hour per day for the first two years.

The completion of this course does not make a finished scholar; it is not claimed by any one; it would be idle to do so. What is claimed is that the student concentrates his energies; he has a definite purpose and there is no subject in the course not germane to his future studies or his future possibilities as a citizen and practitioner.

This gives him keen interest and zest for his work, just those states of mind which the elective system in the general courses is believed to give. Again, the student who does conscientiously the work of this course is as well or even better prepared to follow and profit by the instructions of specialists than are those who have received a college degree.

Concerning the administration of the course I will not assume to speak. I may say, however, that all the sciences, physical and biological, are taught by the laboratory method. So the student gets training in the use of instruments of precision, of exacting methods in biology, chemistry and physics.

There are two years in physiology and the same in anatomy. One year of three hours a week with text-book, lectures and demonstrations, and one of five hours in the laboratory. In this way the student learns histology and its technique—not about them; and in the same way physiological chemistry and bacteriology; in anatomy he learns

the methods of preparation, preservation and dissection. Various animal types are dissected and the work is made comparative, while stress is laid on acquiring skill, neatness and conscientiousness.

I have outlined the character of the course and the manner and spirit in which it is pursued. It is an effort to give young men an opportunity to prepare well for medical studies in the shortest time; and to prepare themselves in a way that increases their ability to concentrate their energies, to handle themselves, and to have confidence in their results. In these qualities, so essential in the professional school and in the school of life, it is maintained they are the equal of the college graduate.

I will not presume to say what medical colleges ought to require for entrance. I can but think that the future of the profession and the welfare of the people would be safer if the requirements were not lower than the amount of study indicated in this three years course. Again, until the State University shall have a medical department requiring for entrance and graduation a high standard of excellence, along the line of Johns Hopkins at present, the least that it ought to do for medical education is to offer such a course as I have outlined and urge it upon the attention of those concerned.

DISCUSSION.

DR. D. P. ALLEN.

The subject is one of great interest. The relative difference between classical training and technical training is quite well discussed. One difficulty in the United States seems to be in the high and preparatory schools. The students do not get into the colleges until they are eighteen or twenty years of age; if they take three or four years for special study, they are twenty-six or seven years old; if they go through hospitals, that adds another year and a half or two years; if they go to Europe, they come back ready to start at about thirty. Men in the United States, beginning the practice after thorough preparation, are considerably more advanced than in Germany or France. A man

should be able to begin work earlier than at present, so that he will not as at present think he must begin the practice of medicine with the sole object of earning money as early and as fast as possible. The present idea is that medical colleges will extend the course to four years. Now, chemistry can be taught in the college or preparatory school as well as in the medical college; also materia medica, botany, physics, and electricity. If a college has a four-year course, the fourth year of an academic course would pretty well fit a man for second-year work. A four years college course and a four years medical course can be put in seven years instead of eight as at present. At the present time physiology, chemistry, etc., overlap each other. The solution reached in Western Reserve University is that a man may go through three years of his course in the ordinary way; in the fourth year he may add such studies as will be equivalent to the first year in the medical college, as electives.

DR. H. J. HERRICK.

I believe the object of the paper is a good one, and I am glad the subject has come before this Society. We are all aware that there have been serious defects along these lines. It is time to make a stand for higher planes. The old idea is that medicine is a learned profession, with theology and law, and it is right that it should be so placed. A man hardly knows before a classical training what he wants to pursue, and I for one am heartily in favor of a classical education as preparatory to a medical education. The subject of education is a very broad one, and not only in mental acquirements, *i. e.* acquisition of knowlege. It is the whole man, the common-sense man, that must be trained.

DR. W. J. SCOTT.

I desire to commend this paper and the purposes of it. To go a little further back, I think the *manual training schools* are of very great value in training young men how to do things and how to think. When a boy has learned the use of his hands in the laboratory, or the blacksmith shop, of the manual training school, his mind will naturally be turned towards special subjects, and such an education will never be lost. When acquired it is worth a great deal. Take a boy who is a natural mechanic, and he will make a

better surgeon when he studies medicine. I think that some boys put to work at twelve or thirteen years will receive as good, if not better, education than if confined to books. Now, while I say that, I am not going to say anything at all against the man having a classical education if he wants it. This gentleman knows as well as I know, that with increase in demands upon reasoning force as we have now, that unless we have some knowledge of the classics we do not know what half the words we see mean. But, sir, when he sees a new word introduced by some classical writer in science, he knows what that word means, and he knows it better than the man who will have to consult a dictionary. Those who have a classical education will make better men as long as they live than if they do not have it. I believe in educating boys thoroughly, but I do sympathize to a certain extent with the idea of having the electives take the place of the old regular course in college. They will then get out sooner and be earlier prepared to begin the work of life. That is the reason I sympathize with it. They will then make better students and better men.

D. S. KELLICOTT.

I wish to express my gratitude for the way my idea has been received. It is said that a man will not be a proper educator until he has children of his own to educate. They will teach him a good many things about education he never thought of before. I want to be understood as urging all young men to begin at an early age, and, if they can take a classical course, by all means take it, especially where there are electives, as there are now in all the leading universities.

THE PREVENTION OF TUBERCULOSIS.

By C. O. Probst, M. D.

Secretary of the Ohio State Board of Health.

I do not venture the hope of presenting much that is new, and certainly nothing that is original, on the subject of tuberculosis. I shall be well pleased if I succeed in bringing before you in a shape to elicit discussion the best ideas I have been able to obtain from those who have recently investigated this subject. In treating of the prevention of tuberculosis it has been necessary to refer at some length to the causes which produce it, and which it is the hope of sanitarians to remove.

If tuberculosis is a preventable disease, surely, considering its prevalence and great fatality, no subject of more importance can occupy our attention. Dr. Billings estimates that 125,000 people died of phthisis pulmonalis in the United States in the year 1890. Hirsch says that one-seventh of all deaths among civilized races occur from tuberculosis.

The vital statistics of Ohio are well known to be very defective, and yet afford information of some value concerning the prevalence of tuberculosis. I have compiled a table from Ohio statistics showing the number of males and females reported as dying of tuberculosis for the ten years 1884 to 1893 inclusive; the total number of deaths reported each year from all causes, and the per cent. of the total number due to phthisis pulmonalis, and to other forms of tuberculosis, including phthisis. Hamilton County is entirely excluded, and Cuyahoga County for 1885-6, for lack of proper returns.

DEATHS FROM TUBERCULOSIS IN OHIO FOR TEN YEARS, 1884-93.

YEAR.	Phthisis.		Tub. Diseases		Total Deaths.		Per cent. of total deaths from Phthis.		Per cent. of total deaths from Tuber. Dis.	
	Male	*Female*	*Male*	*Female*	*Male*	*Female*	*Male*	*Female*	*Male*	*Female*
*1884	1,513	1,913	1,771	2,158	12,898	11,466	11.7	16.7	13.7	18.8
†1885	1,694	2,033	1,838	2,189	13,522	12,586	12.5	16.1	13.6	17.4
†1886	1,727	2,114	1,887	2,253	12,874	11,574	13.4	18.3	14.6	19.4
*1887	1,798	2,249	2.042	2,474	15,460	14,416	11.6	15.6	13.2	17.1
*1888	1,771	1,773	2,044	2,478	16,514	15,113	10.7	11.1	12.4	16.4
*1889	1,711	2,042	2,039	2,351	16,410	15,046	10.4	13 6	12.4	15.6
*1890	1,614	2,044	1,811	2,429	17,135	15,304	9.4	13.3	10 5	15.9
*1891	1,664	1,992	1,928	2,249	17,535	15,562	9.5	12.8	10.9	14.4
*1892	1,543	1,970	1,768	2,181	19,528	17,469	7.9	11.3	9.1	12.5
*1893	1,486	1,794	1,672	2,000	17,417	15.566	8 6	11.5	9.6	12.9
First five years	8 503	10 082	9,582	11,552	71,268	65,155	11.2	15.5	10.9	17.7
Second five years	8,018	9,852	9,218	11,210	88,025	78,947	9.7	12 5	12.9	15.4
Totals	16,511	19,934	18.800	22,762	159293	144102	10.4	13.9	11.8	16.4

*Hamilton county excluded. †Cuyahoga and Hamilton counties excluded. Years ending March 31st.

The number of deaths given is far below the number that occurred, but the percentages are fairly accurate. The total number of deaths reported from phthisis—laryngeal and pulmonary—during the ten years was 36,455, equal to 12+% of the deaths reported from all causes. The number reported from tubercular diseases, under which head is included tubercular peritonitis, tubercular meningitis, including hydrocephalus, and scrofula, was 42,562, equal to 14+%, or about one-seventh of the deaths from all causes.

An interesting fact is brought out in the table. It shows that in Ohio, for the period given, the mortality from phthisis, as well as from all other forms of tuberculosis, was considerably higher for females than for males. There were 16,521 deaths from phthisis in males, equal to 10.4 % of the deaths from all causes in males, and 18,800 deaths from all forms of tuberculosis, or 11.8 %. In females there were 19,934 deaths from phthisis, or 13.9 %, and 23,762 deaths from tuberculosis in all forms, equal to 16.4 % of the deaths from all causes in females. It is usually found that the mortality is greater in males. In England and Wales during the ten years 1881–1890 there were 246,455 males who died of phthisis against 227,513 females. The results in Ohio may be thought chargeable to inaccurate returns, but it is hardly possible that a mistake of this kind should have been made for each of the ten years embraced in the inquiry. It is greatly to be regretted that the vital statistics of Ohio do not afford a more reliable basis for studying the various causes of deaths in the State.

It is now about twelve years since Koch made the announcement that he had discovered the cause of tuberculosis. In concluding his communication he said, "We can with good reason say that the tubercle bacillus is not simply one cause of tuberculosis, but its sole cause, and that without tubercle bacilli you would have no tuberculosis," which caused his distinguished contemporary, Cohnheim, who had already recognized the specific, contagious character of the disease, to say, "I have seldom in all my life felt greater

pleasure than at the reception of this news." So completely was Koch's work done that later investigators have been able to do but little more than verify his assertions. Few will now be found to dispute the proposition that tuberculosis can not occur in the absence of the specific bacillus. There is undoubtedly, however, a tendency on the part of the ultra-contagionists—a tendency to be deprecated—to lose sight of other factors scarcely less essential for the production of the disease. In looking for the cause of tuberculosis with a view to its prevention, we should not fix our eyes on one item, but should look to all the conditions which contribute to the result, and give to each its true and relative value. While inoculation experiments with susceptible animals show that their tissues, even in health, afford a suitable soil for the growth of the tubercle bacilli, clinical experience indicates that man is almost immune to infection under ordi nary circumstances. Certain predisposing causes which lessen vital resistance must usually be added to produce the disease; we must have a favorable soil for the growth of the seed.

In the prevention of tuberculosis, then, we should work in two directions—first to prevent the broadcast sowing of the bacillus tuberculosis, and second to fortify the soil against its growth.

Let us consider the latter, the predisposing causes, first. Heredity will here easily take first place. While the tubercle bacillus has, in a very few instances, been found in the fœtus, and some still maintain that the disease may be directly inherited, the weight of opinion is almost wholly on the side of those who hold that only a predisposition is entailed—that the child of a consumptive parent will with great probability contract the disease when exposed to the exciting cause. How may we control heredity? It has been urged that the state should prevent the marriage of consumptives, or the children of consumptive parents. In line with this some one has proposed that physicians and not clergymen should be authorized to solemnize marriage.

I presume there are not many instances where persons actually sick from tuberculosis marry. Many children of consumptives remain free from the disease, and many more would escape if proper precautions were used. But whether legislation to prevent such marriages would be wise or unwise, we need not expect any movement in this direction with the present public feeling in the matter. Much may be done, however, for the children of tuberculous parents. They should be specially guarded against prolonged or close exposure to the exciting cause, as in nursing a phthisical parent or wife without proper care of the sputa; while by strict and continued attention to all the conditions that favor physical, especially chest, development, and the maintenance of a high standard of health, their resistance to the tubercle bacilli should be increased. The duty of imparting such instructions belongs to the family physician, and is one no one else can so well perform.

After heredity, occupation may well come as a factor in the production of tuberculosis, more especially pulmonary tuberculosis, by far the commonest form of the disease. Here we are offered greater hope for success in our efforts for prevention, as many of the injurious influences of occupation may be removed, while the predisposed individual may choose a calling free from danger.

Certain occupations in which workmen are necessarily and continuously exposed to the inhalation of dusts, especially dusts with sharp cutting points, are attended by a comparatively high mortality from pulmonary diseases, including phthisis pulmonalis. In the 45th (1885) Annual Report of the English Registrar General is given the comparative mortality of 64,641 males between the ages 25 and 65, following different occupations. In that number 1,000 will die annually from all causes, and 220, or about one-fourth, from phthisis. In ten dust-inhaling trades the number dying from phthisis will be 347, or 127 more than the average. To state the same fact in another form—against 1,000 deaths from phthisis in all males between 25 and 65 years, there

will be 1,576 deaths from this cause in the ten dust-inhaling trades. This greatly increased death-rate is not due to greater exposure to the tubercle bacillus — the dust is usually a pure mineral or vegetable dust, but is doubtless attributable to pulmonary injuries which favor either the entrance or growth of the bacillus, or possibly both; and it is to be noted that while these workers in dust present an unusually high comparative death-rate from phthisis, they are still more frequently the victims of other forms of pulmonary disease. Other occupations show a preponderance of deaths from this disease. This is specially noticeable in occupations carried on in close, badly ventilated rooms, where little physical exercise is required, and where constrained position is unfavorable to chest development — as among tailors, shoemakers, printers, and the like. Compared with the 220 deaths from phthisis in each 1,000 deaths from all causes among all occupations, there are for shoemakers 254, for tailors 285, and for printers 461 deaths from phthisis. The death-rate from other respiratory diseases is low, and the conditions predisposing to phthisis are clearly unlike those in operation in the dust-inhaling trades. As the general death rate is even below the average, the high phthisis death-rate cannot be due simply to lowered vitality. The cause is probably to be found in the constant breathing of pent up, vitiated air, which acts both to concentrate the bacilli cast about the work-shop by those already affected, and to produce a pulmonary condition favorable for their growth.

The causal relation of badly ventilated living- and sleeping-rooms to pulmonary tuberculosis, both for man and animals, has long been known. The occupations attended with a low death-rate from phthisis are practically all outdoor occupations, while, *per contra*, a high death-rate is almost invariably found among those constantly exposed to prebreathed air, as in prisons, barracks, nunneries, etc.

An opportunity is here presented for the State to very materially lessen the loss of life from phthisis, and at the

same time from other causes. Laws should be enacted compelling owners and operators of shops and factories to provide appliances for the removal of all machine dust. Workmen exposed to dust arising from hand operations which cannot be so removed should be urged, or required, if possible, to wear respirators. Greater attention should be given to the ventilation of such places, and minimum requirements as to air space per capita and renewal of air should be provided for by the State and enforced by its agents. While something has been accomplished in this direction in Ohio by the Department of Workshops and Factories, very much more remains to be done.

The State should also undertake to secure proper ventilation of school-houses. This is notoriously bad in a large number, and should not be tolerated. It cannot be doubted that the constant breathing of impure air in school-rooms lays the foundation for much of the disease, of tuberculous as well as of other character, occurring later in life.

Municipal authorities should provide for the ventilation of cities by the judicious location of public parks, and by regulating the width of the streets and height of buildings; the proper cleaning and sweeping of streets is also a factor in lessening the spread of tuberculosis and other air-borne diseases. The overcrowding of the dwellings of the poor, especially tenement houses, favors the development of phthisis. This is a difficult matter to control. Glasgow regulates her lodging and tenement houses by fixing the maximum number of inmates each house and sleeping-room may contain; and enforces the requirement by inspections made without announcement, by night or day. While such inspections would doubtless not be tolerated here, something might be done by public authorities to improve the sanitary condition of the houses of the poor.

Of the other predisposing causes of tuberculosis, damp soil and dwellings will alone be mentioned. The relation of soil dampness to the prevalence of phthisis was independently pointed out by Dr Bowditch of this country and Dr. Bucha-

nan of England many years ago. In a number of English towns it was shown that on the introduction of drainage works, by which the ground water was kept below foundation walls of dwellings, the mortality from phthisis was reduced from 11 to as much as 47% in one or two places. Sewering cities already having a dry subsoil was not followed by this effect. Mr. Simon, after a later investigation of the subject, reported that "it confirms without any possibility of question, the conclusion previously suggested, that dampness of soil is an important cause of phthisis." (Buck's Hygiene, Vol. 2, p. 578.) The importance of providing for subsoil drainage is not sufficiently appreciated by town authorities, and it frequently happens in introducing a sewerage system to remove household wastes by water-tight sewers, that no provision is made for lowering the ground water by an independent, pervious drain. Sewerage, then becomes a factor in reducing the mortality from phthisis; and municipal authorities might also require the proper drainage of the soil upon which dwellings are to be located. Various other predisposing causes enter into the production of tuberculosis, and, to a variable extent, are removable or avoidable, but cannot be now considered.

We turn next to the exciting cause, the bacillus tuberculosis, and the measures to be taken to destroy or avoid it. This is strictly a parasitical microbe and will not under ordinary conditions grow outside of its host. It is still undetermined whether the germ produces spores, but it has been positively proved that it may preserve outside the body its capability for growth for at least several months. It may usually be found in all tuberculous discharges, but is chiefly disseminated by dried sputa of persons suffering from phthisis pulmonalis.

How can such dissemination be stopped? If every person suffering from this disease could be induced to expectorate into a receptacle containing a disinfectant solution, or into cloths to be at once burned, the ravages of tuberculosis would undoubtedly be very greatly lessened. We

need not expect that this can be brought about by an act of legislature. Not until the masses are made to realize that consumption may be communicated from person to person may we hope for general observance of such measures; but though every case may not be reached, nor perhaps even the majority at the present time, much may be accomplished. With the careless and apathetic patients self-interest may be brought to bear, for there is little doubt but consumptives often reinfect themselves and start the disease afresh. Is it not possible that one of the great advantages of the open-air treatment of consumptives arises from the freedom from auto-infection? The public press should also be enlisted in this educational crusade; and the State Board of Health, by properly prepared circulars, should widely disseminate among the people plain instructions for the prevention of consumption. Pennsylvania has a society for the prevention of tuberculosis, and a league with this object has been established in France. Ohio might, with advantage, undertake something of this kind. Among the intelligent classes, when properly instructed, we may hope for observance of preventive measures when at home, but not, as a rule, when they are abroad. They will either expectorate into a handkerchief, or onto the street or floor, if a cuspidor is not at hand. The handkerchief, as pointed out by Cornet, is a specially dangerous article, as the sputa in it soon dry, and the bacilli are liberated whenever it is opened. When a handkerchief is used by a bed-ridden patient there is then danger of infecting the bedclothing, as the handkerchief is usually kept about the bed. With the ignorant and vicious we can expect but little care to be taken of the sputa, either at home or away. From the consumptives of this class who are yet able to work, some protection may be afforded by securing their intelligent oversight by their employers during the time they are in the shop or factory. In theatres, halls and other places of public assemblage, and in railway cars and steamers, it would be possible to require that cuspidors containing a disinfectant should be provided.

Koch has shown that sunlight, and even diffuse daylight, destroys the tubercle bacilli in a few hours, and if we could only have dwellings, shops, factories and public buildings looked after, we need not greatly fear danger from consumptives upon the street.

There is always great probability that a room occupied by a consumptive has become infected, and such a room, when vacated, and the clothing and bedding of the patient, should be disinfected. Unless the relatives or friends are both willing and intelligent, this should be done under the direction of the health authorities; wherever this seems necessary the attending physician should report the fact to the board of health.

Should tuberculosis be made a notifiable disease? The Michigan, California and Washington State Boards of Health have recently adopted this rule. The proposition has been thoroughly considered by the New York Academy of Medicine, and by the Philadelphia College of Physicians and Surgeons. The former voted in favor of it, the latter against it. In my judgment it would be unadvisable to attempt to enforce such a rule in Ohio until public opinion has declared in favor of it.

The establishment of hospitals for consumptives is to be recommended, not only as affording isolation for dangerous cases that can not be properly cared for at home, but as a means of cure in selected cases. Many such institutions have been established in Europe, and one of the general hospitals in New York City has recently been set apart for this purpose.

It would be wholly beyond the scope of this paper to consider all the various ways in which tuberculosis may be communicated, and the measures to be taken to prevent it. The danger of direct contagion through kissing, drinking vessels, autopsies, and the Jewish method of arresting hemorrhage from circumcision, the liability of contracting the disease by sleeping in a room, and especially the bed, occupied by a consumptive, the dirty and possibly infected

sleeping car blankets, the illy ventilated berths of sea vessels with a consumptive for a companion—these and many other sources of danger readily suggest themselves.

One important channel of infection remains to be considered—viz.: The ingestion of tuberculous meat and milk. It is practically settled that tuberculosis of animals is caused by the same bacillus that causes the disease in man, and that the disease may be communicated by one to the other. The extent of tuberculosis among animals of this country is unknown, though it undoubtedly prevails to a considerable degree. Milch cows are specially liable to the disease. There is not only danger in eating the flesh of such animals, but the bacillus may gain access to the milk, though this danger is probably not great until the udder has become affected. The prevalence of intestinal tuberculosis in children is believed to be due largely to the ingestion of raw milk from tuberculous cows. Experiment has shown that the bacillus is not destroyed by the gastric juice; but as a temperature of 152° F., according to Fraenkal, will destroy it in a short time, boiling the milk and thoroughly cooking the meat will remove danger from this source. As we can hardly expect to stop the eating of rare meat, or the drinking of unboiled milk, steps should be taken to eradicate the disease among food-producing animals. With Koch's tuberculin the disease may be diagnosed in its early stages, and affected animals may be isolated, and if necessary, destroyed; while by attention to ventilation and cleanliness of stables the spread of the disease among animals may be greatly lessened. There should also be an inspection of the slaughtered animal, not only for the prevention of tuberculosis, but for the prevention of other animal diseases communicable to man.

The facts and arguments presented in the paper seem to justify the following conclusions:

1. Tuberculosis is invariably due to the action of the bacillus tuberculosis.

2. The healthy human body, under ordinary circumstances, is immune to the disease.

3. Among the predisposing causes productive of tuberculosis are (*a*) heredity, (*b*) certain occupations, (*c*) breathing impure, especially prebreathed air, and (*d*) dampness of soil and dwellings.

4. The knowledge that tuberculosis is a communicable disease, and instructions for its prevention, should be widly disseminated among the people.

5. State and local authorities should combat in every possible way the predisposing causes of the disease, leaving mainly to attending physicians the proper care of patients to prevent infection.

INFECTION IN TUBERCULOSIS. FOOD PRODUCT.

H. H. Spiers, M. D., Ravenna.

No factor is more conducive to the well-being of a people than diet or food product. If we turn to history and seek those nations which have secured the most lasting regard or aggrandizement, we invariably find a people well fed. *Per contra*, should we seek the race or tribe lowest in the scale of existence, whose history, if so it may be called, lies in the unwritten legend or tradition, whose home is migratory and uncertain, we find an insufficient diet, with alternate plenty or privation.

Brawn and brain work most harmoniously and efficiently when food product is adequate to the animal economy. So true is this statement, that, other circumstances being equal, given the diet for five consecutive generations the condition of a people can be fairly determined.

No better illustration can be given than in the examples of Great Britain and India. Great Britain, synonym for strength, has fought with nearly every nation of the earth, and to-day controls a domain on which the "sun never sets." Great Britain — a land of liberal diet. India, synonym for weakness, vast in area, population, resources and willingness to pay taxes, great in little else, is controlled by a few thousand alien soldiers. India — a land of restricted diet. Exchange the food product of these two countries for five generations: Think you their relative strength would remain the same? As

with the nation, so with the individual, though less marked. Show me the man or woman whose whole life diet has been scant or insufficient, and I will show you the intellectual or physical weakling. Bone, brain and muscle are built on food ample in quantity, good in quality, and in reasonable variety.

When little Oliver Twist calls for "More," it is no idle childish whim or folly, but is an urgent call of wronged nature. The soup is too thin, the quantity too small, and the quality deficient. Are there any little children in this land of plenty who are calling for "More"? Examine closely before you say no.

Thus far we have spoken of normal or wholesome food product. But at times a staple production fails or is defective or diseased, through climatic or other causes. A people dependent on one production must then face starvation or become enervated through diet. The famine in Ireland through failure of the potato crop or local outbreaks of ergotism through eating black rye, etc., are familiar examples.

Again, a product may be defective in that it is improperly cared for. Moldy hay or musty grain must impair the health of the animal that eats them. Overripe fruits, partially decayed vegetables, or meats improperly kept, must cause sickness to the consumer. Now in regard to a food product there is only one royal way: *To select only the best.*

Of food product there is only one with which we all are perfectly familiar — only one that fulfills every indication, meets every want and in truth is ideal: Pure milk. Perfect and familiar food as milk is, no article has been more used and misused. To-day it stands eulogized and condemned. One fact remains: *Pure milk is a perfect food.*

The purity of milk is affected by intrinsic or extrinsic causes. In other words milk may be changed during secretion or after it is withdrawn. To the various changes that take place after milking we will not refer, but simply state they all may be prevented for a longer or shorter period by proper sterilization. Various apparatus are on the market,

and perfection in this regard seems to be reached. While sterilization is regarded so favorably, there is one thing it can not do, as will shortly appear. Of the changes that take place at or during secretion we wish to speak more particularly.

1st. It is asserted by high medical authority that tuberculous animals secrete milk containing bacilli. So far as known no one argues their presence in the milk. Seeing is believing.

2nd. By proper sterilization the bacilli may be killed, and the resultant milk rendered a perfect food.

In the judgment of the writer this statement is as near prevarication as is Bill Nye's description of a cyclone. It contains some truth, but most of it is mythical. That bacilli may be killed by sterilization, that there are cyclones, no one denies. That a perfect food can be obtained from sterilized tuberculous milk is as hypothetical as Nye's description.

There are two things of which American physicians can justly feel proud: Practical ideas and good common sense. Suppose during the famine in Ireland the Americans instead of sending a ship-load of corn had sent a ship-load of sterilizers. Would the famine have stayed? Suppose during an endemic of ergotism one should suggest sterilization. "My dear sir, we do not eat uncooked rye. It is ground, made into loaves and sterilized in the oven. The people still die." No sterilization will change a diseased grain or a partially decayed potato into perfect food product.

Fondness of a bargain is likewise American. Suppose I have five tons of moldy hay. It is sterilized after the most approved German method. Is there a physician in this hall who will pay a full market price for this hay? The hay is an imperfect food before a mold fungus starts. Killing the mold fungi does not restore perfect hay.

Milk secreted by a tuberculous animal is a diseased product — a diseased product before bacilli are found. Killing the bacilli by sterilization does not restore a perfect milk.

Milk is a secretion; an elaboration of materials from the blood. If the blood be pure, the milk is pure, and *vice versa*. It is known that nervous impressions increase, diminish or vitiate the milk flow. It is also known that the milk of a syphilitic is poor in quality and should be nursed only in exceptional cases. What shall we say of the milk of an animal suffering from a constitutional disease? To the writer it seems a fallacy is foisted unwittingly on an intelligent public.

Are there any little children in this land of plenty who are calling for more? Herein it seems to the writer lies a secret of the 50 per cent. of mortality under five years of age. Believing this, could you conscientiously recommend condensed milk for children, gathered as it is from unknown sources? Poor as are all artificial infant foods in that they do not contain the elements of nutrition, they are superior to commercial condensed milk in that they do not contain elements of disease.

Some one may ask what is the chemical difference between diseased and healthy milk. Some one may likewise ask what is the chemical difference between a diseased and a healthy potato. Cook them and your three-year-old child will see a difference. Use the two kinds of milk and you will perceive a difference. Have you ever said to a mother: "You must not nurse your infant. You are in ill health. The milk is a diseased product."

In the moral or physical world no man should find fault with present conditions unless he be able to point out a better way. If pure milk be the only perfect food, if the infant human race must live on milk, the way to obtain pure milk is the desideratum of the century.

1st. We must have healthy animals.

2nd. The keepers of animals must conform to hygienic laws.

3rd. Every precaution should be taken to keep milk pure.

How shall we obtain healthy animals? What says the

New York Health Board? "Use the tuberculin test, and kill all diseased ones." To the writer this seems like crossing the valley of Lethe on the bridge morality. The bridge — a very fine structure — *stops in the middle of the river.* In less than five years New York will again have to adopt the scientific method. While removing diseased animals, would it not be a higher wisdom to procure healthy progeny by selection?

Keepers of animals must conform to hygienic laws. It is astonishing how inconsistent we are. Mothers must be very careful of diet, etc., etc., while nursing infants. Cows are allowed to be crowded in filthy stalls; eat moldy hay; drink stagnant water; without air, exercise or sunlight; milked at all hours; the milk, delivered twenty-four hours late, is sterilized, and pronounced perfect baby food.

The man who sells rotten bananas and robs you of your child is no more guilty than the man who thus cares for his cows and spreads disease and death. They should alike be held amenable to law.

Every precaution should be taken to keep milk pure. Herein lies a field for sterilization.

How about infection in tuberculosis? Does food product infect? Food product, if imperfect, lowers the vital resistance. Lowered vital resistance in a tissue means weakness in that tissue. *It is the condition of the system that allows the bacilli to enter.* A celebrated writer has said: "Take care of the minutes and the hours will take care of themselves." So likewise, care for the food product and the system will guard itself against bacilli.

IS CONSUMPTION CURABLE?

R. E. CHAMBERS, M. D., CHANDLERSVILLE.

(ABSTRACT.)

The disease that is the subject of this paper is known as pulmonary consumption, phthisis pulmonalis, or tubercular consumption. . . .

Hippocrates wrote about 2000 years ago of the tubercular formation substantially as it was recently described by Charcot, and yet we must ask ourselves to-day, "Is consumption curable?" The testimony of pathologists is that many healed tubercular lesions are found in the lungs of persons dead of other diseases. Dr. Joseph Parish, of Philadelphia, is cited as a case cured, and undoubted evidence of his having had the disease was found at the autopsy. In the opinion of the writer such cures are in reality misinterpreted. There may have been some accidental cause which was removed by natural processes, similar to the following: A young lady while in a glee of laughter at the table drew into her windpipe a piece of chicken-bone. She coughed violently for some time. Three years later she had every appearance of consumption—hectic, prostration, apex consolidation, pectoriloquy and ronchi over right clavicle. The case was apparently hopeless. In a violent paroxysm she coughed up the remains of the fragment of bone, and recovered rapidly. . . .

Forty years ago creosote was popular as a remedy for

consumption, and later gave way to cod-liver oil, championed by Trosseau and Fournet. The latter claimed to have cured fourteen cases of confirmed tuberculosis.

Marshall Hall recounted the marvelous results from diluted alcohol administered by saturated linen placed over the affected apex. Later the *Lancet* heralded the Capua military hospital cure. It consisted of tartarized antimony, cloves, and marsh-mallows, given to produce nausea. . . . I have tried them all faithfully, prompted by a new hope with the heralded advent of *a new remedy for consumption.*

[Narrative of cases illustrating hereditary transmission of the disease, and hopelessness of treatment in this class.]

Case VI. is exceedingly interesting. A young man had been under treatment for some time at the hands of Dr. C. for supposed tuberculosis. I was called at midnight to see him and found his condition most distressing. Respiration 50 per minute, pulse not countable, and he was apparently failing rapidly. Had a lancet been at hand I would have bled him. I gave him magn. sulph. and tartrate of antimony, and also Norwood's tincture in five-drop doses. At the same time I directed that cold compresses be applied to the chest, changing them every fifteen minutes, with intermission if chilliness were produced. This was carried out faithfully. In eighteen hours he was improved and eventually made an excellent recovery. It was observed that the towels used for compresses were stained brown. I thought at the time that it was the iodine stain. Later I reported the case at a meeting of the Academy of Medicine at the residence of Dr. Hildreth, and thereupon Dr. C., the former attendant, explained that he had been giving him from one to one and a half grains of iodine at each sitting in vaporized form, and that he had had the usual inhalation the day previous to my first night call. This man recovered and is in good health today. Dr. C. had made the diagnosis of incipient tuberculosis of the lungs. I had not concurred in this opinion. I am reluctant to record it as a cure of tuberculosis.

In conclusion: Forty-four years' experience with all the

light attainable by theory and practice, tuberculosis "still proves as intractable in the management as at the very dawn of medical science. Being fully established, I doubt whether a cure was ever effected. Not an instance have I seen, and I believe that those who report to the contrary deceive themselves or the truth is not in them."

DISCUSSION.

DR. CHAPMAN.

I was very glad to hear the first paper presented to us this afternoon. Five years ago I had the privilege of reading a paper on the tubercular diathesis, and the doctor has taken the same grounds I did at that time. I do believe there is a way to prevent consumption which we are learning every day. The time will come when we, as medical men, will be called into a household to be constant attendants so long as there is a possibility of tuberculosis remaining in the family. It is a disease which may be prevented by proper attention to the general hygiene, and especially to breathing of the patient. By sending to another climate, we can often have the pulmonary vitality re-established. It is my hope that the history of the future will not show fourteen per cent. of deaths from that horrible disease.

DR. H. S. STRAIGHT.

I have spent so much time on this subject that I feel my Cleveland friends will be disappointed if I do not say something.

The gentleman has spoken of *tubercular diathesis.* Now I think that it has certain physical signs; that it is a catarrhal condition, and that it is not primarily tuberculous, and that a great many of these cases recover. Six years ago, when I began to take the leap in the dark on this, I called it the pre-tubercular diathesis. Dr. Sawyer calls this a disease of the mucous membranes, an irritation of the mucous membranes, and it is true the mucous membranes of the body are more or less affected. The gastro-intestinal mucous membranes are first affected. There is, also, disturbance of the mucous membranes of the lungs and of the genito-urinary tract. Now, the name I have chosen for this is *apex catarrh.* It is more hopeful, of course, to make a diagnosis

before the patient has the tubercle bacilli in the sputum. For a number of years I have been connected with a dispensary, and have had only one of these cases recover after the bacilli were found in the sputum. I am inclined to the opinion that when you find the bacilli in the sputum the man is doomed. Yet, I see other cases, which have no cough, no bacilli in the sputum, but they complain very considerably of gastro-intestinal disturbances, are anæmic, and are treated for all sorts of things. It is called everything from anæmia to chlorosis, muscular rheumatism, etc., etc. These persons often have catarrh of the apex down to the region of the third or fourth rib. By the time you have bronchial breathing or have consolidation, you have incipient phthisis. Yet there is a stage in many cases that precedes that condition by many months during which you get positive physical signs. It is a catarrh of the lung that is non-tubercular but predisposes to tuberculosis. If the patient can be taken then and treated, and given to understand that there is something serious the matter with him, he may be cured.

DR. H. J. HERRICK.

I expected to hear from my friend, Dr. Probst, some more specific suggestion as to the prevention of tuberculosis. I was certainly pleased with the paper, and I find that the bacilli theorists are hedging a little. He states it is accepted that the bacilli is the cause and the whole cause, and yet the paper goes on to talk about hygienic conditions. My conscientious experience would not recognize the bacillus as the only cause; I would regard it as a factor, not to be fought by antiseptic agents but by hygienic measures. I regard the disease as one of impaired nutrition, involving primarily the digestive organs. I can hardly accept the "apex catarrh" theory. It is a secondary condition. In my mind all those troubles have their origin back in the gastro-intestinal tract, and you must look back there for the cause of the difficulty and the cure. I think it is not difficult to show the connection between impaired nutrition and assimilation, and this condition of the lung. I would not think of treating the apex catarrh or anything that way without regard to the constitutional condition, the intestines and the digestive organs. I believe that is the key to the situation, and our cures have come in that direction. Creosote has been referred to as the great remedy, and unquestionably as an antiseptic it does help, but it is valuable in

other directions. We are getting away from the idea that the bacillus is the sole thing to be fought.

DR. BEARDSLEY.

A few words as to whether it is the bacilli that produces the disease or not! Koch and others say so, but it does seem to me that a condition must exist before the bacilli can gain foothold. There must be a tubercular diathesis. But it is the *cure* that we want and not vagaries on the pathology.

DR. MURPHY.

I want to thank Doctor Probst. While I agree with him, I must say he is in the minority of the bacteriologists. When Koch announced he had discovered the bacillus tuberculosis, he did not pretend to say whether the bacillus was the cause or the result, and that question to-day is one which is perplexing.

When I discover a case of phthisis, I order them to flee, to go at once to a high and dry climate, and delay not. Now, how this high, dry atmosphere acts as a germicide upon the bacillus I do not know, but that people do get rid of phthisis I do know. We find tubercles encapsulated in the lungs, and yet they often die of other acute disease. If there is a climate that is bad, that is vicious, it is this climate from Lake Erie to the Cumberland Mountains.

Now, about the question of inherited diathesis. As a rule those afflicted are poor eaters. There is defective assimilation. There is little or no reserve vital force. Those are the people who are going to have phthisis. They are the people, who, if they have pleurisy, it becomes purulent. Now, this very class are benefited by climate and especially by living out of doors.

DR. PROBST.

I think it will be necessary for me say but little in closing this discussion.

The points presented in my paper, and which, I think, are well supported by authority, were that tuberculosis is caused by the bacillus tuberculosis plus a *predisposition*, which may be inherited or acquired. The only difference of opinion among those entitled to speak with authority on

the subject seems to be as to how much weight shall be given to predisposition. All, or practically all, agree with Koch that the disease cannot occur in the absence of the bacillus; but many believe that something more is usually necessary to produce it — that heredity, occupation, impure air, damp soil, and various other causes act to predispose one to the disease, either by creating a soil favorable to the growth of the bacillus or by lessening the natural powers of resistance. In our measures for the prevention of tuberculosis, we should therefore not only look to the destruction of the bacilli — the exciting cause — but should endeavor to remove the conditions which favor its development — the predisposing causes.

As you are aware, the State Board of Health has recently made inquiry of the physicians of Ohio concerning certain points in regard to tuberculosis, and some interesting reports were received bearing upon the communicability of the disease. Eleven hundred and forty-nine physicians, a little more than one-sixth of the entire number, have reported. Of this number, five hundred and nine reported cases coming under their personal observation, of the communication of the disease from one person to another. In one hundred and thirty-eight cases the disease was apparently communicated by the husband to the wife. No history of heredity in the wife in eighty-two of these cases; in the other fifty-six cases the facts as to heredity were not given. One hundred and thirteen cases were given where the disease was apparently communicated by the wife to the husband. In sixty-eight of these there was no heredity on the husband's side; in forty-five, facts as to heredity were not stated.

These cases, I think, clearly indicate the possibility of tuberculosis being communicated, and without hereditary predisposition.

LA GRIPPE

IN THE DIFFERENTIAL DIAGNOSIS BETWEEN SCARLET FEVER, MEASLES AND ROETHELN.

JAMES L. TRACY, M. D., TOLEDO.

In this paper it is taken for granted that there is such a disease as la grippe, also that there is such a disease as roetheln. The paper is founded upon the belief that when grippe is a prevailing disease, it may to a greater or lesser extent enter into and complicate the differential diagnosis between scarlet fever, measles and roetheln. The theme of the paper is the showing of these complications. Differential diagnosis is always between atypical, and not typical, cases of disease.

Larger experience in observation and more exact knowledge of a disease, may make a case typical to one physician, whereas lesser experience and knowledge on the part of another physician would cause the same case to appear to him as an atypical one. It is true, then, that every diagnosis that is made bears upon it the stamp of the skill, judgment, care and discrimination of the physician who makes the diagnosis. An instance which illustrates this truth from at least one point of view, may be mentioned. In our city there is a physician the very expression of whose countenance convinces you that he has the most childlike trustfulness in his ability to conquer disease. As he hurries along the streets, one is forced by his intense earnestness to share with him the hope which he so plainly expresses, that he may reach the bedside of his patient "in time." This

man, against whose honesty of purpose it would be heartless to have a doubt, has never been known to diagnose anything but liver troubles.

Physicians are continually dealing with life's peculiarities, so that it is hardly to be wondered at if a peculiarity sometimes attaches itself to a physician. There is, however, a wide difference between having a peculiarity attach itself to a man, and having a man attach himself to a peculiarity, when you come to think of it.

When a disease has been endemic for a considerable time, as may be said of grippe in this country during the past three or four years, then the physician who has seen a good deal of it naturally carries the image of grippe along with him, and naturally, too, he will measure his patient first by his grippe image measure, just exactly as our co-worker lays over his patients his liver-trouble image measure.

Up to within a few years ago I was often led to wonder at the frequency with which I found evidences of malaria in my patients; lately I have thought that I could detect in the expressions of physicians whom I have had in consultation that it would be quite as well if I found less grippe. Nevertheless I am of the opinion that in many instances those conditions which are present, and which are looked upon as aberrations, are in reality the symptoms of co-existing disease.

I do not know of any one of the many symptoms and conditions which enter into the aggregation of symptoms which we call la grippe, which has not singly and by itself, time and time again, been present in other diseases, and still grippe was not a complication. There are cases, though, wherein the probability of grippe as a complication must be taken into account. Pneumonia may add itself to grippe, and I believe that grippe may add itself to pneumonia. In such cases pneumonia should be diagnosed, and grippe should be diagnosed.

To illustrate one phase of the part which grippe may play in the diagnosis of the acute exanthemata, permit me to re-

port the sickness of the members of almost an entire family. In the family are six children; the youngest is seven, and oldest eighteen years. Excepting the youngest, all of these children had had scarlet fever several years before. The youngest child was taken sick with frontal headache, pain in back and in neck, dizziness, smarting eyelids, chilly sensations over the back, pain in bowels, which were somewhat tympanitic and constipated, eructation of gas, vomiting, frequent scanty urinations, sore-throat, spasmodic cough, heavy feeling upon his chest, enlarged anterior and posterior cervical glands. Tongue was coated white, through which the enlarged papillæ projected. He had been incessantly delirious during the night. Temperature 102, pulse 80. During the next few days these symptoms remained practically the same. A sensation as if falling through the bed annoyed him a good deal, and frequently he would sweat quite profusely. About three days after I first saw him an eruption appeared upon the chest, and in twenty-four hours it had spread over the entire body. The eruption was not perceptibly elevated, neither were white marks left upon pressure. It was confluent, and no crescentic arrangement could be made out.

In eruptive diseases, a physician is obliged to make a diagnosis within a very brief time, whether he is satisfied as to the nature of the trouble or not. The fact that the child had not had scarlet fever, and the presence of the strawberry tongue, which had become very pronounced, decided me in favor of scarlet fever, and the case was so reported.

After the family had been in quarantine for three days, all of the other children began to complain of aching bones, pain in neck, dizziness, sore-throat, cough and nausea. The cervical glands were enlarged, tongue slightly coated, and papillæ much enlarged. The cases were exact duplicates of the youngest child in beginning stage, only their symptoms were much less severe.

The presence of the strawberry tongue in these children

who had had scarlet fever, showed me that I had attached too much importance to it as a diagnostic symptom, unless these were having a second attack. Examination of urine failed to show albumen in the youngest child. No eruption appeared in cases last taken sick, and indeed their trouble passed away in a day or two. I changed my diagnosis to roetheln, and notified the health office of my former mistake.

The mother was taken sick just as the older children were recovering, with the same symptoms which had been present in all of the cases, though much more severe. She was confined to the bed for a week, having all of the symptoms so commonly present in grippe. No eruption appeared upon the mother.

The desquamation in youngest boy's case was bran-like over the body, but upon hands and feet he could pick the skin off in flakes.

I think now that the youngest child had grippe with roetheln as a complication, and that the others were cases of grippe. The rule is that adding the same number to unequal numbers does not change the differences between those numbers. Theoretically, then, grippe and scarlet fever, grippe and measles, and grippe and roetheln ought not to be any harder problems so far as the diagnosis of the unlike diseases are concerned, than they would be were they uncombined or uncomplicated. I take it that the symptoms mentioned as being present in older children and in the mother, are the same as have been present in grippe as it has prevailed during the past winter.

So, add to scarlet fever, spasmodic cough, coryza, sneezing, smarting eyelids, profuse perspiration, with sudamina and consequent roughening of the surface, the abdominal pains, and you have a case which will not be easy to differentiate from measles.

Add to measles, vomiting, strawberry tongue, enlarged anterior and posterior cervical glands, high initial fever, and you will be likely to diagnose scarlet fever.

Roetheln is a disease which occupies all of the uncovered ground between scarlet fever and measles, so that slight additions serve to turn the scales towards one or the other of those diseases, as the case may be; as, for instance, in the case mentioned where a strawberry tongue turned them toward scarlet fever. Had there been instead bronchitis with moist rales, sudamina to roughen the skin, I presume that I should have reported the case as measles. In cases where I suspect roetheln I always examine for enlarged cervical glands, because I believe that the condition is never absent in roetheln. I believe the same condition is present in almost every case of grippe.

There are cases of measles which are so plainly that disease, that the diagnosis may be made at a glance. The same may be almost as boldly said of scarlet fever. Of roetheln the statement cannot be made. The possibility of a complication by grippe of these diseases has not been brought in here, because heretofore their diagnosis has always been an easy task, as the cases of the exanthemata wherein perplexing uncertainty in diagnosis exists are sufficiently numerous to rob them of humdrum routine.

The wish behind the brief consideration of the subject has been, however, that thought might follow along the lines of differential diagnosis, and that in the discussions which may be had, points and landmarks may be fixed in our minds which will be of use and profit at the bedside of the next patient.

SCARLATINA.

AMELIA J. PRIOR, M. D., CINCINNATI.

In presenting to this body a paper on scarlatina, I realize that I am taking up a subject that for over two hundred years has been studied, and its course, progress, prevalence and epidemic character have been carefully recorded. Ever since the seventeenth century when for four years (1661-65) it was epidemic in London, and Sydenham made a careful study of the disease, for the first time making a diagnosis between that and the other exanthematous diseases, physicians have written monograms without number. It has prevailed in this country since 1735, and at the present time is the most prevalent and fatal of all the exanthematous diseases. I have purposely avoided going into detail, giving etiology, period of incubation, symptomatology and sequelæ as we find them in our text-books. The time of the Association is too valuable, to say nothing of exhausting your patience by giving you from this floor what each physician present has in his own library and can read at his leisure. J. Lewis Smith, in his book on "Diseases of Children," devotes seventy pages to this one disease — half as much as he devotes to diseases of the cerebro-spinal system, and more than half as much as he devotes to all the diseases of the gastro-intestinal tract. In the short time allotted us here, we can only hope to touch the most important points. I have tried to condense my paper as much as possible in order to leave time for the discussion, for the subject is one

of vast importance, not only to the general practitioner, but to the obstetrician and surgeon as well, since it enters their domain too, testing their skill and calling forth their best efforts to control the disease and prevent its dreadful ravages. It is my purpose to treat the subject from a clinical standpoint, showing the different phases of the disease as we find them in actual practice, giving briefly a report of a few cases.

CASE I.— On the night of June 30th, 1891, Ed. S., a boy of nine years, was brought to my office by his mother. She gave the following history: Very early that same morning, his uncle had taken a train to one of the suburban towns, intending to spend the day in fishing, and had taken Edward and his brother Robert with him. Previous to that time they had been perfectly well, but during the day Edward had begun to vomit, complained of sore-throat, headache, and was so sick that his uncle had returned on an earlier train than he had intended. There was an extensive inflammation involving the fauces. The tonsils were greatly enlarged, presenting a somewhat similar appearance to that found in follicular tonsillitis. He was suffering with intense headache, was vomiting occasionally, and his bowels were loose. When we study the theory of the disease, or as students on the bench we listen to the didactic lectures of our able professors, we imagine we know just how the disease looks. But this being the first case I had ever seen, I must confess that I did not make a correct diagnosis that night. I prescribed for him thinking it was tonsillitis. The next day I was not asked to see the case, but I heard from the family that some eruption had appeared on his body. They supposed he had been poisoned by coming in contact with poison vine in the country, because during the day a similar eruption had appeared on the body of the other brother. I then suspected that it was scarlatina and was called to the case the next day, and was able to make my diagnosis from the angina, eruption, and strawberry tongue. The other brother, when questioned, denied that he had any sore-

throat, but on examination I found that it was in the same condition as that of his brother. These two cases were only ordinary cases. There was no serious complication in either of them, the younger brother suffering slightly from rheumatism. Six days later a boy of four years was attacked, and two days after a girl of eleven years. There were no marked symptoms in the beginning of the attack of the third boy, but the nervous symptoms were very marked in the case of the girl. There was twitching of the muscles, jerking and tossing about on the bed, moaning and occasionally assuming a sort of sing-song voice, which almost amounted to active delirium. The mother spoke of this condition being exaggerated during the night, when she kept up a constant muttering all night, sometimes almost screaming in her sleep as though in great pain. The cephalalgia was marked, and the pain in the left ear was so great that at times it almost seemed unbearable. The temperature was very high, her pulse unusually rapid, and the heart was beating so violently that one could almost see a movement of the chest with each heart-beat. I ordered antipyretics, cold sponge-baths, and had the ear syringed out with water as hot as could be borne, followed by a few drops of peroxide of hydrogen. After wiping out the ear, a little powdered boracic acid was put in the ear and allowed to remain there until the next washing. At the end of four or five days the serious symptoms had all subsided, and her recovery though somewhat slow, was uninterrupted. But the boy of four years, which at first had seemed only to have a mild case, was the one which proved to be the most serious. At about the fifth or sixth day there was a formation of a membrane, which covered the whole of the pharyngeal wall, the tonsils, uvula and extending into the posterior nares, which was very similar to a diphtheritic exudation. This was attended with dysphagia, swelling of the cervical glands and infiltration of the cellular tissues of the neck. The swelling outside about the neck and jaws was considerable, so much so that at one time I feared an abscess would be

the result. For several days he ate nothing, taking no nourishment except a very little milk. At this time I gave him carbonate of ammonia with brandy, each dose being forced down his throat. As it was very near my office and not having much to do, I saw the case and swabbed the throat out four times a day with a 50 per cent. solution of peroxide. I ordered it done every two hours, but the mother was having some domestic trouble at the time and was somewhat negligent, and it was only done when I was there. This condition lasted about five days and then began gradually to disappear, the throat being entirely cleared off in a few days. He had rheumatism in the feet and the ankles were considerably swollen, which prevented his walking for about a week or ten days later. Although his recovery was very slow, it was complete, and in two months afterward he was stronger and weighed more than ever before, and has ever since remained perfectly well.

CASE V was that of Anna R., an Irish servant-girl, 19 years of age, who had only been in this country one year. She had been complaining for two days when I called to see her late one evening. She was vomiting frequently, was suffering intensely with her head, had a high fever and rapid pulse, and as she expressed it was suffering very much from a sore neck, and seemed very much prostrated. I examined her throat and found it very red and inflamed, and at once suspected scarlet fever, but after a careful examination of her body I could not detect any eruption whatever. I inquired into her history and she told me that about a month previous she had been exposed to scarlet fever, but she did not know that she had been since that time. I visited her early the next morning and the diagnosis was then not difficult, for the eruption covered the whole body. She suffered from rheumatism of the left arm and shoulder so much that at times she was barely able to raise her hand to her head. She was lying in a very small room with only one window, and the weather was excessively hot, being the month of August; not having any one to bathe her and give her the proper

attention, her recovery was not as rapid as it otherwise would have been. The desquamation began at the end of the second week and continued for several days, even after she was up and around.

CASE VI.—Miss W., aged 23, came to my office on the evening of September 11th, complaining of sore-throat. Her history was as follows: She had gone to work in the morning perfectly well and remained so until about noon, when she first felt some soreness in her throat. During the afternoon she suffered so much from headache, high temperature and vomiting that she was scarcely able to walk. On examination I found the temperature 103.5, pulse 120, and throat highly inflamed, presenting every appearance of typical angina of scarlet fever. Not wishing to alarm the patient unnecessarily I did not mention the fact to her. I prescribed for the angina and told her I would see her in the morning. I was called to her room very early the next morning, and she told me that she had suffered intensely during the whole night, had slept none, and had vomited frequently. While placing the thermometer in the axilla, I examined the chest and found the rash distinctly marked, appearing on the hands, face and lower extremities later in the day. In this case I had every opportunity of carefully studying the disease. The patient was boarding in the same house in which I at that time had my office, and I took great care to study the disease from a clinical standpoint as compared to our text-books, finding many points of difference. I used the same treatment as in the former cases, but in addition to the antipyretics, whenever the temperature went above 100.5 I ordered the nurse to give her sponge-baths, always reducing the temperature and giving a sense of relief to the patient. In this case the throat symptoms predominated. She was given all the cracked ice that she wanted, both day and night, which seemed to relieve the angina more than anything else. But during the first week she suffered so much from headache and great disturbance of the nervous system that she obtained very little sleep at any time,

except after receiving the sponge-bath the temperature would be reduced, the nervous symptoms allayed, and she was enabled to obtain a little refreshing sleep. In the second week her recovery was very rapid, and at the end of the second week she asked permission to return to her work. Her position was a very responsible one. She was book-keeper and private secretary for a firm which at that time was in a very critical condition, being on the verge of an assignment, and she felt that her position could scarcely be filled by any other than herself. Very much against my wishes she returned to her work in the beginning of the third week. During all this time no desquamation had taken place, and as I had informed her that such would be the case, she was eagerly watching for it every day. In the third week I was speaking to a physician of the case and he told me I was surely mistaken in my diagnosis, that there would not be scarlet fever and no desquamation for that length of time; but I still maintained that my diagnosis was a correct one, and at the end of the third week or beginning of the fourth, desquamation began, and the epidermis was removed from the palms of the hands and soles of the feet in great large patches which would convince any doubting physician that desquamation was complete.

These few cases present many different phases of the disease, a few peculiarities which I wish to emphasize. In the first two cases, there was no known source of contagion until the same day in which the disease appeared, the house to which these two boys were taken being at the time infected by children who were suffering from scarlet fever. This might seem to us one of the cases in which Sam C. Busey in Keating's Encyclopedia of Children's Diseases, says: "In occasional instances, the disease has developed a few hours after the first and only exposure," for the two children in this family who remained at home did not show any evidence of the disease until six days later. Busey in the same article just referred to says: "In other instances, far more numerous, it has been delayed for even weeks, its latent vitality

remaining unimpaired for considerable time." This would seem to apply in the case of the two young ladies just reported, for neither of them was aware of any exposure to the contagion for more than a month previous to the appearance of the disease. One might judge from the first two cases that the disease developed the same day of the exposure; and yet, in a city the size of Cincinnati, where the disease is always prevalent in some parts of the city, and knowing as we do how easily the disease may be conveyed by the clothing, furniture, toys, flowers, letters, or by any wearing apparel, either of the sick person, physician or nurse, it is difficult for us to determine exactly the period of incubation. In each case I used the routine treatment laid down by all authors, that of giving for internal treatment tr. chlor. of iron and chlorat of potass. with glycerine and water. In addition to this for the angina, I used a spray of menthol and iodine in ol. albolene. For the high temperature I used in most of the cases phenacetine, combined with salol in the cases where the cellular tissues were infiltrated and where the cervical glands were very much enlarged. In each case I made frequent examinations of the urine, for a period extending over four weeks, and in the last case reported for a period extending over five weeks, and never at any time was there a trace of albumen in any case. I gave tonic treatment in each case for about two weeks, usually giving some form of iron, quinine, and strych.

In regard to the contagiousness of the disease, I believe that where an early diagnosis is made, it is possible by well-directed ventilation and isolation of the patient to limit the spread of the disease in the household. In the last case reported, I directed the nurse to use every precaution. The patient was placed on the top floor, there was free ventilation, the stools were disinfected with carbolic acid before being emptied, and no one else in the house was infected with the disease, although there was one young man who was considerably younger than she. The last two cases reported are interesting from the fact that not many cases

occur at that age. In Sajous' Annual for 1893, J. B. Carver, of Fort Scott, Kansas, says: "He has noticed that in families where the disease existed among children, older ones and parents would suffer only from sore-throat. He could not recall to mind in all the cases treated a single instance where the rash was present in a patient over 16 years of age."

I looked over the statistics in the records kept by the health department of our own city, and found that in 1892 we had reported 767 cases of scarlet fever. Among these there were twenty cases reported over 20 years of age. The oldest was 47 years and the youngest three weeks.

Another point I wish to make is, that some of the dangerous sequelæ so frequently following as a result of scarlet fever, might be avoided with proper care. In the case of the girl of eleven years with the severe ear symptoms, I feel assured that had the treatment not been directed to that as it was, we should have had as a result middle ear trouble, probably resulting in deafness, as we have in so many instances, and in the case of the boy of four years, although we had every evidence of septic trouble, we had no paralysis, nor at any time was I able to find albumen in the urine. I examined a specimen of it every few days in order to satisfy myself and to be ready to combat any kidney trouble that should arise. Authors tell us that as long as the temperature remains below 103, it may be considered a mild case, but I believe that if sponge-baths were given frequently, with very small doses of antipyretics, phenacetine preferably, we would have fewer cases of heart failure. In the last case of which I spoke I noted carefully the result of the baths and small doses of antipyretics. The effect was beneficial, always being followed by a decline of temperature and pulse-rate. In private practice, especially among the poorer class where no nurse is employed, and where there is a lack of clothing and bed-clothing, the necessary changes can not be made to insure perfect cleanliness, which certainly adds to the comfort of the patient and hastens recovery. But the physician must always impress upon them the necessity of doing as much as possible to accomplish that end.

DIPHTHERIA.

J. S. HALDEMAN, M. D., ZANESVILLE.

The name at the head of this production was known at different periods by somewhat dissimilar names, formerly diphtherite, nearly the same as now, having only a different terminal, but the same Greek root (diphthera). It is one of the oldest epidemic diseases known. In the times of Homer and Hippocrates, views were advanced from which Bretonneau first sought to show that the disease was then known under the name of Malum Ægyptiacum, and was greatly dreaded. A preventive for the malady was conceived by combining sulphate of copper with honey, which was highly recommended and extensively used, and was retained in the Pharmacopœia for centuries under the name of Unguentum Ægyptiacum.

Aretæus, at the close of the first and opening of the second century, gives a characteristic description of the Malum Ægyptiacum, in which he especially emphasizes the fact that the tonsils were covered with *quodam concreto humore albo*, and which spread over the tongue and gums, and was attended by a loathsome and unendurable fetor, fluids were regurgitated through the nostrils, and hoarseness and even loss of voice accompanied it. Sometimes it extended itself suddenly to the air tubes, producing death in a short time by suffocation. Children then, as now, before the age of puberty were the most frequently attacked. It appeared to have its locality mainly in Egypt and Syria, hence its name.

Macrobius later on mentions and describes most minutely a similar disease to that named by Aretæus, prevailing malignantly, of an epidemical character, in Rome, A. D. 380. It appeared again in an epidemic form further on in the centuries, first in Holland, when Forestus, or as he more frequently modernly is named, Peter Van Forest, of Delft, Holland, came to the front, and became pre-eminent as wonderfully successful in the treatment of this disease, for which he received a considerable pension and was retained as the public physician for thirty years. It also in the seventeenth and eighteenth centuries spread more extensively over Europe, and especially in Spain, when it prevailed very destructively, and under dissimilar names. When it occupied the cavity of the mouth, it was called fregar, but when it only involved the larynx, causing death by suffocation, it was called garrotillo, a Spanish term derived from *garottar*, which means to bind, a name which they applied to *cynanche maligna* in general from its sense of strangulation, as if the throat was bound with a cord.

Those who made noteworthy observations relative to this disease in these centuries last named, and became conspicuous, were quite numerous. Notably so was Carnevale, in Italy; Chomel, in France; Heredia, in Holland; Schobinger, in Germany; Fothergill and Huxham, in England; and Samuel Bard, in North America, which latter figured pre-eminently in the first establishment of the New York Hospital, and was for many years one of the physicians to the institution.

The statements made, however, bearing upon the antiquity of this malady, must be received with many grains of allowance. They may not be fully trustworthy. The symptoms described, many of them, are in common with many other diseases of a more modern date, such as scarlatina, and others of an exanthematous kind. The first investigations of an approximately reliable kind of the true nature of diphtheria, were made by Bretonneau, in the first quarter of the nineteenth century, in the year 1821. During this year, they

were presented by him in the form of two treatises to the French Academy of Medicine for consideration. He first named it diphtheritis, on account of its essential characteristic. It shows itself in the mucous tissues of the throat perhaps the first, but not necessarily so, affecting the tonsils and fauces, and if not soon arrested will extend into the submucous tissue, fully imbedding itself there and widening into the adjacent tissues of the mouth, nares, trachea, œsophagus, and frequently into the ear cavities, communicated thither through the Eustachian tubes. It likewise manifests itself at times in the skin upon the external surface of the body; and we may say pretty generally, if we examine minutely; sometimes in patches, either on the arms, chest, abdomen, or lower extremities. Sometimes we have seen it cover the entire body in the form of very fine pustulæ. We think the place given it by Bretonneau in the nomenclature very appropriate, and expressive of its locality.

According to Bretonneau's opinion, an inflammation with no exudation was not diphtheritis; and an inflammation with exudation is not diphtheritis when it is not propagated by contagion. He believed the only way by which the disease could be conveyed to another was by inoculation, and that the air was not a medium of its spreading. He claimed that if the diphtheritic secretion, or dust-like atoms, came in immediate contact with the soft mucous membranes or the skin became deprived of its cuticle, it would most certainly be communicated. He claimed that croup and diphtheria were identical, and that the latter was only the highest degree of the former. Virchow, however, disclaimed this theory strongly. But on the other hand, Wagner confronted him, and advocated their homogeneous nature. Bretonneau also at first insisted that diphtheria was wholly a local disease, but was obliged at a later period to concede, when he saw and learned more fully its nature, that a blood poisoning was one of its essential and evident characteristics. The profession upon this point from that time until now has been divided, some maintaining that it is solely a local dis-

ease, and others that it is both local and constitutional. We think, however, that the bulk of the profession, modernly, is drifting in the direction of the latter. And here again, now as formerly, the opinion which precedes is a mooted one, the local or the constitutional. Oertel states that he has satisfactorily shown by a series of experiments, that diphtheria begins as a local disease, and develops afterwards into a general one; and that the general one is maintained by the local. Hueter and Oertel, about the same time, thought they made the discovery that diphtheritic membranes, the subjacent diseased parts, and even the blood, contained in great numbers vegetable organisms, or bacteria, to which they gave the name micrococci. Pathological experiments were at once undertaken to solve the question. It is said that Trendelenburg and Nassiloff first proved the possibility of infecting animals with diphtheria by inoculation in the trachea and on the cornea Nassiloff, in unanimity with Hueter and Oertel, designated the prolific growth of bacteria, which he discovered in patients afflicted with the disease, and in the inoculated cornea, as the essential element of diphtheritic contagion.

The disease starts from and fixes itself at the point of inoculation, and extends from that location through the whole system. This idea of transmission, however, stands in contradistinction to the one that the poison may be taken into the system some other way, either by the lungs, stomach, or intestines, without causing any appreciable local destruction of tissue, and penetrates the whole organism, and finally advances centripetally to a certain part and then locates itself.

Diphtheria may occur sporadically as well as epidemically, and in certain localities especially favorable to it, it may become endemic. Then it develops spontaneously, its cause being a miasmatic poison, induced by coming in contact with objects and persons infected with dipththeria. Therefore diphtheria is to be considered a miasmatic contagious disease. It is needless to say anything more relative to its

contagiousness than this present advertency, for it is universally conceded to be such, as much so as variola, rubeola, scarlatina, etc. How the contagious poison may be communicated, however, is worthy of a cursory notice. It may be conveyed through the air alone, or by solid matters to which it may have become attached. Therefore it is spread by the exhalations passing from the affected person through the air surrounding him, as well as by actual contact with the products of the disease. The virulence of the contagion depends very much upon the susceptibilty to an impression from it by the individual exposed. Some are more susceptible constitutionally than others. It is so, more or less, in all exanthematous diseases, viz.: scarlatina, variola, rubeola, etc. Some can come in contact with the diphtheritic virus with impunity and not be affected by it, while others will be by the slightest possible approach. Children seem to be particularly easily impressed by it, especially those under twelve years old. Those of two, three, four and five years appear to be the most commonly seized, and the most likely to succumb to its life-destroying demand. Those, however, strange as it may seem, under five months are exempt and impenetrable to its ravages. So far as our observations are concerned, the sexes among children, and also adults, are about equally susceptible. Some authors, however, state that the male sex is more liable to be attacked than the female. Albu states that such are his observations, especially those of the age of four years, and his observations have extended through several epidemics. We are inclined to the opinion that in his and others' observations they may have been more fortuitous than otherwise.

A question of no minor importance in this disease is, if brought about by a poison, what is its period of incubation? Now, the period which elapses between the moment when the diphtheritic virus comes in contact with the body, and that when the development of it becomes both subjectively and objectively discernible, is variously estimated; it de-

pends in the first place, on the kind and amount of the infectious material; and secondly, on the force of resistance, as well as on the structure and texture of the tissues which permit the entrance and absorption of the diphtheritic matter. These conditions may cause the facilities for progressing to be exceedingly varying. The action of the noxious matter on the tissues begins the moment it comes in touch with them, and so their reaction begins with the earliest irritation. But changes in them of sufficient extent to be plainly recognizable, and the appearance of a constitutional disturbance in the form of fever, are not brought about until these processes have reached a certain degree of intensity, and involved a sufficient extent of tissue. Accordingly, then, the incubative stage is longer or shorter in proportion as the poisonous matter which is brought in contact with the body is great in amount and intensified. It is shorter consequently during an epidemic, especially if the type is malignant, than when it prevails sporadically. It is supposed to be greater when the matter is brought in direct contact with the body, or when there has been long continued exposure to the disease, than in those cases in which the contagious elements which are diffused throughout the air are inhaled for a short time only. We learn, then, from actual experimentation, and also from general observations, that the period of incubation varies from one to eight days, and in rare cases to fourteen days.

Rogers and Petero, who have figured so largely in experimentation and observations, state that it may vary from two to eight days, and have known it exceptionally to cover a period of twelve and fourteen or more days. Newman states that in his observations the stage is very short, seldom going beyond two or three days, and in no case did it reach to eight. Prof. Bartels and Dr. Kardel remark the proper way to determine the duration is to note the particular time when the exposure to the contagion takes place, and especially when direct contact of diphtheritic products occurs, such as mucous shreds of exudation, with mucous

membranes of the mouth and fauces. Under such circumstances the disease appears regularly on the third day. In our opinion, from the many cases that have come under our observation, this is about correct; exceptionally it may vary.

The disease may assume different forms and degrees of virulence. Of these there may be some four.

I. The catarrhal — which is the mildest.

II. The croupous — in which the fibrinous exudations are manifest.

III. The septic—in which the disintegration of the exudations takes place, followed by processes of decomposition and gives rise to septicemia.

IV. The gangrenous—in which the inflammation may so deepen and intensify that the textures and functions of the parts may entirely lose their vitality, and the most offensive sloughings obtain.

The disease may be arrested in any one of these forms by timely, careful, constant and correct medication and treatment. The cure in the first and second is much more easily accomplished than in the third and fourth. In the fourth it rarely takes place. Therefore, it is highly important that we diagnose correctly from the beginning, and make an herculean effort to arrest and, if possible, cure the disease before it reaches the septic or sloughing stage. This the practitioner may not be able, many times, to do, from various causes. He may not see the patient in time, and if he does, his orders may not be strictly carried out. And, too, sometimes the disease assumes such a formidably malignant type from the commencement as to baffle the greatest skill and science on the part of the physician, and care, assiduity and affection on the part of the nurse.

It will be profitable, doubtless, to notice for a moment the diagnosis of these forms before entering upon the treatment. The catarrhal variety, perhaps, is recognized with the greatest difficulty, from the fact of its apparent insignificant symptoms, when other affections may be taken for it. Its

further development and passage into a more serious form generally removes all doubt, and confirms any previous suspicions. Catarrhal anginæ may be taken for it, as also hyper-secretions from the tonsils, coupled with moderate redness and swelling. Aphthæ also may be taken for it, if they appear upon the mucous membrane of the soft palate, especially if the aphthous vesicles run together and represent a larger ulcer. When the croupous or septic form appears, there is generally high fever, great prostration, brain trouble, tumefaction of the spleen, swelling of the neck glands, exudation and difficulty of swallowing, dyspnœa and hollow cough. The gangrenous variety is known by the gangrenous lesions in the mouth. If any doubt should still linger in the mind as to the presence of this form, after the accurate weighing of all the symptoms and consideration of the repeatedly destructive processes in the thickened false membrane, stained by frequent bleeding, the removal of these broken down masses, and laying bare of the mucosa, deprived only of its epithelium, will itself make the diagnosis sure. Paresis is also a very frequent accompaniment of this affection.

We come now to the treatment, and perhaps none too soon. Your patience may have wearied with the dry recital merely of the histology, etiology, pathology, infection, incubation and diagnosis. You may be more anxious, as perhaps we are, to learn how to get our patients, who are afflicted with the malady, well. Allow us to say at the outset that the remedies, or would-be remedies, are multitudinous, and if we do not succeed it surely will not be for the want of them, but may be more for the lack of skill properly to select and wisely to apply them. Our treatment must necessarily be directed to its entirety of composition—the elements that enter into its formation, to wit, its local trouble, constitutional, and sequelæ.

In reference to the local difficulty, our remedies must first be of a character suitable to the reduction of the inflammation depending upon the infection and its direct results;

and second, to prevent, if possible, a septic condition and general poisoning of the system. The first remedy, then, in our opinion, that would be indicated, would be the free use of ice in the mouth; not externally, though we are aware some have recommended it. Under our observation and in our practice it has always proved unsatisfactory. Local bleeding has also been recommended and tried, but we think of very little avail. Modernly, however, it is seldom resorted to, and is rapidly becoming obsolete. The mechanical removal of the pseudo-membranes has been advocated and practiced, arguing that thereby we are more liable to remove the germs, whatever they may be, of the infectious material. Cauterization for the same purpose has been used. The various astringents have been brought into constant requisition, thereby contracting the inflamed mucous membrane, and checking the exudation. In this way, they generally answer a good purpose, and cannot well be dispensed with. We have long since abandoned the mechanical removal of the false membrane in any form, and especially that barbarous one of swabbing. Gargling or syringing the parts, however, is highly proper and indispensable with disinfecting liquids, such as diluted alcohol, or solutions of bromochloralum, chlorate of potash, permanganate of potash, carbolic acid, etc. The cauterization method, we said, has had, and still has, its friends. In general we do not endorse it, and use it only when the deepened ulcers are slow to heal, after the exudations have principally passed away and the secretions begin to assume a healthy aspect. At this stage of the convalescence these deepened ulcers sometimes appear to be at a stand, and hang on, and are loath to depart. To touch them a few times with the crude nitras argenti starts the process of repair.

The use of warm water, and particularly the hot vapor, has its stern advocates. It may do well in the hands of those who use them, but they do not as a general thing in ours. Cold internally and warm externally, however, have worked admirably in our practice and under our observa-

tions. The use of quinine, and chloride of iron, and sulphuric acid, and glycerine, premised by a thorough gargling of the mouth and fauces with a pretty strong solution of the chlorid of sodium, or some one or other of the gargling or syringing solutions already alluded to, for local benefit and use, have in the majority of instances proved satisfactory and given the best of results. We give them in a liquid form in combination. The compound we denominate compositus glycerinæ ferri. The patient is required not to take anything nor swallow for some time afterwards, so it may remain about the parts as long as possible. It will then accomplish three things: First, it will dissolve the false membrane; secondly, it will give tonicity, both to the throat textures and its organs and functions; and thirdly, it will most likely intercept, if not remove, septicemia already formed, and impart general strength and vigor to the patient. One drachm of this preparation should be given every three or four hours. Turpentine, carbon oil, or other stimulants should be constantly applied externally to the throat. If the bowels need opening, epsom salts should be preferred as an aperient on account of their antiphlogistic character. Cathartics, for the most part, should be avoided; by so doing the strength of the patient will less likely be interfered with. For food, milk is to be preferred, both on account of its nutrient qualities, and its easy and convenient administration. Next to it would be rice water, or barley water, or some of the fruits in liquid form; no solids should be used. Their only tendency would be to irritate and keep alive the inflammation. As stimulants, wine may be used, egg-nog, milk punch, or almost any of the alcoholic stimulants.

This is an outline, perhaps a faint one, of our general treatment. But when any special organ or organs become involved, a departure from this course may have to be made. Additional articles will have to be given to spend their virtue and potency upon the part or parts impaired.

PREVENTION OF PERTUSSIS.

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I cannot say anything on the subject of whooping-cough but what each of you already know, but if this paper should serve as a fresh notice that a wolf in sheep's clothing is in our land, then my desires shall have been accomplished.

As far back as I have been able to compare diseases, I have wondered why whooping-cough was allowed to be considered by the laity as it is now, when the profession know so much about it. There are many parents who, for the want of the proper advice, have said that they want their children to have this or that disease, believing "it will not go so hard with them, if they have it while young." They are not taught that adultness offers a fair immunity from childhood's infectious diseases, and that it is no more necessary for children to have chicken pox, mumps, measles, whooping-cough, etc., than it is for them to have small-pox, diphtheria, pneumonia, or any other disease. Again, they are not impressed with the fact that whooping-cough is one of the most contagious diseases, and one among the most fatal diseases to which children are heir. Too often do we meet pertussis on the streets, in the car, in the boat, in the pew, in the schools, and its victim in the hearse.

In the rules and regulations of the Ohio State Board of Health, adopted June 30, 1893, we find Rule 1 says: "No

person suffering with diphtheria, scarlet fever, small-pox, measles, whooping-cough, or other dangerous communicable disease, shall be admitted into any public, parochial or private school or college or Sunday school, or shall enter any assemblage or railway car, street car, vessel or steamer, or other public conveyance." Is this rule obeyed or enforced, or even attempted to be, in cases of whooping-cough or measles? No; at least in many cases it is not.

Rule 4 says: "It shall be the duty of every physician called to attend a person sick or suspected to be sick with cholera, yellow-fever, small-pox, diphtheria, scarlet fever, measles, whooping-cough, typhoid fever or typhus fever within twelve hours thereafter to report the name and residence of such person to the board of health. . . . " Are these requirements met in cases of measles, whooping-cough, typhoid and typhus fevers, which four diseases aggregated 1,725 deaths in Ohio in the year of 1892—15 more than the first five (cholera, yellow fever, small-pox, diphtheria and scarlet fever)? No. Not assuming that whooping-cough, measles, etc., are as destructive as cholera, yellow fever and small-pox, but that while we are intently gazing through the field-glass of quarantine at yonder cannonade of yellow fever and small-pox, the musketry of whooping-cough and measles pour in with epidemic volleys in close range, year after year, until the death heap is greater than we suspect.

Rule 5 says: "It shall be the duty of the board of health . . . when a case of small-pox, yellow fever, typhus fever, diphtheria, scarlet fever, or measles is reported within its jurisdiction to at once place . . . in a conspicuous position on the house wherein any of the aforesaid diseases occurs, a quarantine card or flag . . . and to prohibit entrance to, or exit from such house. . . ." Here, whooping-cough, the most highly contagious disease known, except scarlet fever, is not mentioned for placarding. Neither is measles or typhus fever placarded, which the rule requires.

Rule 10 says: "No public or church funeral shall be held in connection with the burial of a person who has died of

cholera, small-pox, yellow fever, typhus fever, diphtheria, scarlet fever, measles, or whooping-cough, and the body of such person shall not be taken into any church, chapel or other public place." Yet, how inexcusably is this good rule disobeyed in the deaths from whooping-cough and measles.

The State Board of Health with its local boards has saved untold hundreds of lives; and we advocate the belief that it can save at least a few more lives by acting upon this disease, pertussis, more earnestly.

Whooping-cough is a malady almost entirely limited to infancy and childhood, and but few escape it, because of the great activity of its contagium, of the carelessness on the part of the profession, and of the ignorance on the part of the laity.

The following information has been gleaned from the Vital and Nosological Statistics of Ohio from the year 1889 to 1892 inclusive: During these four years pertussis has caused a little less than 1 per cent. of all deaths; and has caused 26 per cent. of all deaths under ten years old. And during these four years it has caused 1,197 deaths, while scarlet fever has caused *only* 397 more deaths at the same time. Owing to the unreliable sources of collecting vital statistics by the assessors, the secretary of our State Board of Health says that at least 40 to 50 per cent. of the deaths of Ohio are not returned. This is perhaps more true in regard to whooping-cough than scarlet fever, because of the insignificance in which the former is considered.

Dolan says whooping-cough ranks third in fatal diseases of infancy in England; and causes one-fourth of the annual deaths of children in London. In Ohio the death-rate is still higher from the same cause.

Griffith says 120,000 died from this disease in England and Wales in 9 years; and 85,000 in Russia in 5 years — an average of 17,000 deaths per year.

Winters says it is thought that whooping-cough with its complications and sequelæ is more fatal than either diphtheria or scarlet fever.

Starr says that next to scarlatina whooping-cough has the highest mortality of all diseases among children.

Whooping-cough *per se* is not dangerous, but the high mortality is due, as Dr. Winters has said, to the complications and sequelæ, which are said by Goodhart to occur probably in one-third or one-fourth of all cases. There are three general reasons why these complications or sequelæ come on: 1st. The younger the infant or child, the more prone, except under three months, and greater are the deaths. 2d. Children insufficiently clothed and nourished; and children whose vitality is reduced by constitutional disease, or by unhygienic conditions. 3d. A susceptibility to be seized at the same time with measles, each rendering the other more hazardous.

These complications and sequelæ are: broncho-pneumonia, bronchitis, lobar pneumonia, atelectasis, pleuritis, emphysema, pneumothorax, tuberculosis, nephritis, heart strain, pericarditis, dropsy, œdema of glottis, membranous croup, aphasia, paralysis, hemiplegia, epilepsy, eclampsia, meningitis, cerebral hemorrhage, hæmoptysis, epistaxis, aneurism, sub-conjunctival hemorrhage, conjunctival ecchymosis, emesis, anorexia, enteritis, hernia, rectal prolapsus, blindness, deaf-mutism, lingual ulceration, goitre, eruptive fevers, sclerosis and marasmus; only about forty in all. Fortunately, many of these complications and sequelæ are uncommon or perhaps rare, and some too often accidental; but indeed, unfortunately, the most serious are the most common, *i. e.*, broncho-pneumonia. It would be no extravagance to presume that the mortality from pertussis would be still higher if the death reports were more completely and properly reported and classified. It is a peculiar fact that when a secondary affection attacks, the primary disease abates or is lost sight of entirely for a greater or less time. Therefore, a child in several years hence may die from phthisis, heart strain, etc., whose origin was whooping-cough, but failed to be so reported and recorded, and consequently unknown.

Allow me to say here that we, as physicians, do ask for a more complete vital statistics in Ohio.

Begging pardon for the above digression, which at most would only refresh your memory, we will now direct our thoughts towards the subject.

The prevention of pertussis is the avoidance of the cause; and the cause is an active contagium. If this be true, then it is a preventable disease; and if it is a preventable disease, with the knowledge of the high mortality and low record, we should censure ourselves for such a condition laid at the door of the medical profession. Horrifying! it seems to me, to let a single life go out that might have been saved by our present knowledge of medical science and art. Any movement that would reduce the mortality to any considerable degree would be commendable in proportion to the reduction produced.

Whooping-cough and measles seem to be of no great importance even by boards of health, from the fact that no precautions are enforced. Diphtheria, the most dreaded of all diseases of children, caused 383 deaths *less* than did measles and whooping-cough; and these two diseases caused 69 per cent. of as many deaths as diphtheria and scarlet fever together. It is the consensus of a few authors and secretaries of State boards of health with whom I have been communicating on this subject, that quarantining against whooping-cough would be beneficial; but from the suffering it would produce, they would not like to see a system of house quarantine. Considering the longevity of the attack, and the poor classes which are most likely to feel its ravages, quarantining would now be not only impossible but impracticable. But we must not compare health or life with trouble or expense, for there is no comparison. What are we to do? 1st, Remove to an infectious disease hospital. 2nd, Isolate. 3rd, Teach. 1st. A hospital for infectious diseases only, and maintained by the corporation, would be the ideal method of prevention of pertussis, but alas! 'tis only a dream. 2nd. Isolation would be more tangible, but

would be more unsatisfactorily enforced for several reasons. Serious objections were proposed against quarantining small-pox at first, but no one questions that wisdom now. To card the house for whooping-cough (and measles) the same as we do diphtheria and scarlet fever, would be doing little enough towards quarantining. It is uniquely strange that children who have whooping-cough or measles, the two most highly contagious diseases (with very few exceptions), which kill nearly three-fourths as many as the two most dreaded maladies common to children, are permitted to go at liberty on the streets and elsewhere. It is a shame for intelligent Ohio.

About the only objections to *house-carding* for whooping-cough, are the difficulties of making an early differential diagnosis; also the irregularity of the course of the disease; also, the contagiousness of pertussis patients, which is as long as the patient coughs, but of course not the same degree as in the paroxysmal stage. Because we cannot prevent all the children from this contagium is no reason why we should not attempt to prevent as many as we can. We will then be doing more than we are now doing, and in time will receive our merited reward.

3d. Teaching the laity of the destruction secondarily caused from whooping-cough is our duty much neglected. We should be the people's protectors, and be active against everything that would jeopardize their health or life. To have them call our attention to any point of danger or benefit of health, is a served notice of our slothfulness, and this notice has been served on me not a few times during the epidemic of whooping-cough just now abated.

The laity can be taught to obey restrictions on one disease as well as another, and whooping-cough will be no more difficult to restrict than tuberculosis, which we hope will soon be under some kind of restrictions.

There are people who send their children to school in any condition for almost the sole purpose of getting rid of them for that time, caring nothing for the exposure of any infec-

tion they may have made to others. Such parents or guardians should be fined or in some other way punished by the health officer. Again, there are children who for fear of being kept away from school will use deceit in the early part of the disease, thereby exposing others. It would then be necessary for each school-teacher to be qualified to act on the prodromic and early diagnostic symptoms of contagious diseases, and prohibit entrance to the school-yard until the receipt of a physician's certificate or a personal visit by the teacher at the home.

DISCUSSION.

DR. KINSMAN.

I realize as fully as any one that pertussis is an extremely contagious disease, but I also recognize that of all the diseases given under heaven and among men, this would be the most difficult to quarantine against and to isolate, because it cannot be diagnosed before two weeks. The damage is done long before the whooping-cough is recognized, so it is almost impossible to quarantine until the mischief has been done.

I did hope to hear something about the present modes of local treatment in the air-passages for the purpose of killing out the microbe, for I believe whooping-cough is a microbic disease. This is a special difficulty. Then, the things said here to be due to whooping-cough I think largely are true, but some I think are either accidental or incidental. I can perfectly understand how whooping-cough is followed by pneumonia, and how it is whooping-cough becomes a contributory cause in the establishment of tuberculosis, in that it gives a proper field or soil upon which the tubercle bacilli can thrive and grow. It is, possibly, a predisposing cause. But you may have whooping cough until doomsday and it will not become a case of tuberculosis. So in the matter of several of these diseases, I do not see the connection between them. Eclampsia occurs, and so does epilepsy, but because these occur, is it reasonable to say whooping-cough causes them? It has been a fault of pathology, considering that because a complication or condition followed a disease, it was therefore dependent upon it.

DR. PROBST.

I do think something should be done along this line, but those who have been engaged in actual practical work find many things that ought to be done that cannot be done. The doctor spoke of the great public alarm over scarlet fever and diphtheria. That enables us to quarantine them. If we can get the public properly instructed first, then we can isolate and even take them to a hospital. Another practical point, which has not been mentioned, is that about half the cases are not seen by physicians. You get an epidemic in town, and it is practically beyond control. The physician is either not called, or is called after the damage is done. We would be very glad, of course, to have the Board of Health properly instruct the people as to the fatality of these diseases, and we will be glad to enforce such regulations as soon as it can be done.

DR. THOMPSON.

There are two other features not yet mentioned. A large number of cases of adenoid vegetations can be traced back to an attack of whooping-cough. My experience in an epidemic of whooping-cough at present in Cincinnati, causes me to believe that the spasmodic cough can be much relieved by the removal of the overgrown tissue, which obstructs the air-passages and keeps up the cough.

Another point I would like to mention here is that I believe many of these infectious diseases are carried into the house by the domestic animal. In one of the severest attacks of diphtheria that I have ever seen, in one family to my positive knowledge the disease was carried into the house by a pet dog. The two rabbits died of diphtheria while I was treating the child. In a case of whooping-cough in my own family just at present, the child was not brought in contact with any case of whooping-cough, but a little dog, the companion of the child, had an attack, and then the child got it. If you trace back some of your obscure cases, I think you will find the cause in the domestic animals.

CERTAIN ENTOZOA OF THE DOG AND SHEEP.

D. S. Kellicott, Columbus, O.

Professor Zoology and Entomology, Ohio State University.

The anatomical laboratories and the clinics of the Veterinary Department of the Ohio State University afford exceptional opportunities to study entozoa of domestic animals. A large number of dogs and cats are used for dissection in comparative anatomy and for demonstration in physiology, whilst most of the domestic animals are dissected by students in veterinary anatomy, or come under the knife in post-mortem examination. Casual observations have been made and recorded on the diseases, malformations and parasites of these animals for a number of years, and more recently more complete records have been commenced. A few of the facts thus accumulated concerning one subject, entozoa, are given in detail in this paper.

There are still, it is thought, many interesting and important questions to be answered by such studies and records as these; for example, what species of entozoa are harbored by our pets and herds? How prevalent are they? What are their life histories? Hence what relations as regards mutual parasites have these hosts to each other and to man? What organs are affected by these parasites? And what are their economic importance and pathologic relations? Intelligent prevention on the part of the flockmaster or scientific treatment on the part of the physician depends upon a knowledge of habits and life-histories of the parasites.

There are many entozoa that have been long known in one stage, but how acquired by their host, or whether they develop direct or in a second host, are mysteries still. The patient accumulation of facts in such cases should continue in the hope that, as in so many other instances, a happy observation, or an accident, shall suggest the key; then all will be plain, and prevention and cure possible.

The well-bred and well-fed dog is a noble animal, a useful one, and a faithful friend. But the dog of the other sort is a menace and a nuisance. This everybody recognizes as true, and yet nobody, it seems, is able to greatly relieve a long-suffering community from this burden. Taxation does not do it; anatomical laboratories are not sufficiently numerous, although I can attest their intrinsic efficiency. Just why people in general will meekly allow themselves to be overrun by sparrows, insect plagues, and the plague of curs, is inexplicable. Perhaps they look upon these things as afflictions of Providence that must be borne as penance not wholly unmerited.

It is widely known that the dog harbors several dangerous entozoan parasites, the first host of which is the sheep; that there are others, the first host of which is unknown; and that a number of these are common to man as well. Cobbold has given a list of twenty-one species infesting the dog, six of which occur in the list infesting man. In speaking of the relation of the dog to sheep-husbandry, Dr. Cooper Curtice says, "The dog is a carrier of parasites dangerous to sheep and man. In the list of parasites of sheep, there are at least four which are common to the dog and sheep." The foregoing remarks rather uncomplimentary to the dog may strengthen the reasons for carefully studying his guests from hygienic and economic points of view. I shall limit myself in this paper to an account of my observations on five species affecting the dog and the sheep; of these one is a distome, three are tape-worms, and the fifth a nematode.

1. *Distomum sp.* in the lungs of the dog.

In March last a large and apparently healthy dog was

prepared in the usual way for dissection by washing out the blood-vessels and injecting them with plaster. The animal, which was apparently part shepherd, had been a resident of the country, but of his habits nothing is known. On opening the thorax, the lungs were found to present unusual appearances; there was less carbon, hence the normal color prevailed, but small brown spots were thickly distributed over the entire surface of the pleura, and scattered over the lobes were many tumor-like swellings of a deep red color contrasting strongly with the general pink of the lung. The tumors were mostly about the roots and along the dorsal borders of both sides. On cutting open the tumors, distomes were found within; some were surrounded by a capsule, whilst others were burrowing after the manner of the large distomes in the livers of sheep and cattle; these burrows were filled with pus and debris. About twenty individuals were removed from the two lungs.

The body of the parasite is deep red and darker along the middle than at the sides; the length when extended, from 15 to 20 mm.; in this state the body is narrower anteriorly, concave below and convex above; it resembles decidedly the larvæ of certain Diptera. After death in reagents it becomes a little broader anteriorly than posteriorly and less flattened. The oval sucker is terminal, but not at the summit of a tubercle as in *D. hepaticum;* the larger ventral sucker is situated in the middle line at the anterior third with the genital apertures normal in front of it; and the excretory pore is in the usual situation at the posterior extremity and slightly dorsal. The cuticle is armed with cylindrical or conical chitinous spines, which make the surface rough as in *D. hepaticum.* The spines, however, are not so pointed as in that species.

The alimentary canal is simple, *i. e.* it consists of a strong muscular, almost globular pharynx, a short œsophagus, and a forked tubular intestine ending blindly. In specimens contracted by reagents the latter is somewhat folded on it-

self; it is also somewhat enlarged at the middle of the body and again reduced in diameter posteriorly.

The excretory system appears to be unusually simple; the serial sections show a vertically widened canal with very few branches, extending from near the fork of the intestine in the midline to the posterior pore; the nitrogenous waste of the general parenchyma appears to be passed to the main canal through minute spaces among its cells.

The brown, flattened eggs are of the usual elliptical outline; the length equals mm. and the width mm. They occurred in immense numbers throughout the tissues of the lung; so numerous were they in the vicinity of the cysts that they changed the hue of the lung to their brown shade; besides those scattered in the tissue were great numbers collected just under the pleura in groups varying from a few to several hundred. These masses were not only in the pleural covering of the lungs, but in the pleura of the thoracic walls; the masses in some instances in rows over the costal vessels, in others opposite the ribs. Very many of the eggs had hatched, the shells were empty, and one end had been removed in the characteristic lid-like manner. No immature forms were discovered after search for them.

How did this host come into possession of its numerous and destructive guests? Where do the young distomes develop? No satisfactory answer can be given. Its life-history is not known. The development can hardly be direct; the limited number of adults, the apparent absence of young and the thousands of empty egg shells are facts not consistent with such an explanation. It is not at all difficult to understand how the eggs or the young, if they escape into the lung, could pass into the air-tubes and finally to the outside world to be taken up by an intermediate host.

A search of the literature at hand has not enabled me to find an account of the species; it has been compared with descriptions, some of them inadequate, of the several species of Trematoda reported from the lungs of animals, and with none of them does it agree; nor does it appear to be identi-

cal with any species from the viscera of animals related to or associated with the dog. But much of the literature of the subject cannot be reached at this time; so I content myself by a mere statement of the facts as observed. The case seems to be unique and may prove to be important. It was certainly a serious matter to the dog, for his lungs were in a very bad way.

Of the remaining species to be referred to I shall speak briefly. The three tape-worms are *Tænia cœnurus*, *T. serrata* and *T. cucumerina* (*elliptica*); these are the only species thus far found to infest dogs examined at the University.

T. cœnurus is by far the most common, occurring in from 15 to 20 per cent. of all old dogs that have come under observation. The number, however, has not been sufficiently large to warrant a positive statement as to the prevalence of the parasite. The species is said to be rare in England; one per cent. of the dogs in Denmark and eighteen per cent. in Iceland are said to be infested. The number of individuals in each host varies greatly; the largest number recorded being twenty-four. They occur in the small intestine, from the duodenum to the cæcum, and not, as Dr. Curtice has stated, near the end of the small intestine.

The cystic stage of this worm, as is well known, occurs in the sheep, producing "gid," or "staggers," by an invasion of the brain. The bladders or cysts containing many scolices, or heads, are swallowed by the dog, and in his stomach each scolex may develop into a perfect worm in a few weeks. I am not aware how prevalent "gid" may be among the flocks of Ohio; if the dog acquires this parasite from the brain of the sheep only, it must be very common; I cannot think, however, that it is the only source, for it would seem impossible for so many city curs to contract them as I have found actually to carry them. It seems to me that feeding experiments to determine whether the rabbit or other rodent may not be an intermediate host, are desirable.

I think it is safe to say that one in every five to ten worth-

less curs roaming our streets and fields, harbor *T. cœnurus* and in consequence scatter millions of eggs upon soil and in streams for the infection of sheep or other herbivorous animals. Is not this an indictment sufficiently serious to warrant even heroic measures to get rid of the menace?

Tænia serrata occurs occasionally in the alimentary canal of dogs that are sacrificed in the dissecting-room. Cobbold states that five per cent. of English dogs harbor them, and a large part of hunting-dogs contain them. It appears to be quite rare with us. The life cycle of this species begins in the rabbit. The latter must be eaten, but the destroyer with his sweet morsel takes the seeds of future trouble. It is plain that rabbit for valuable dogs should be cooked. *Cysticercus pisiformis* is the name the parasite bears when in the rabbit.

Tænia cucumerina, whilst common in Europe, is rare in Central Ohio. I have always found it associated with *T. Cœnurus*. The intermediate host is the dog louse, *Trichodectes canis*.

Œsophagostoma columbianum, the nematode, of which I wish to record the occurrence in Central Ohio, is a grave parasite of the sheep in southeastern United States Dr. Cooper Curtice, in "Animal Parasites of Sheep," fully describes it, with an account of its habits. It will be sufficient to state here that its immature stages produce the "nodular disease of the intestines." The worm invades the submucosa, and becomes the cause of a more or less nearly spherical mass of a cheesy or later of a stony matter. The masses vary greatly in size, the largest being more than a quarter of an inch in diameter. The adult worm lives in the large intestine.

In the winter of 1892 Mr. J. R. Wells, a student, brought me from Josiah, W. Va., a part of the small intestine of a sheep which had evidently died from the effects of the worm in destroying the function of the intestine. There were scores of the cystic masses in every foot of length. In the winter of 1893 I was permitted to witness a post-mortem on

a sheep suffering from the same cause; the animal was one of a flock owned near Columbus. Others of the same flock were reported similarly afflicted. The worm evidently has a wider range than was once supposed, and may be doing damage in our section that is attributed to some other species.

DISCUSSION.

DR. KINSMAN.

I have been connected with the Live Stock Association of the State of Ohio for eight or ten years, and there are some facts I will mention, throwing some light on the parasites affecting some animals. It has been known for a long time that a common cause of death among horses is an aneurismal dilatation of the mesenteric arteries. We have found some cases in Central Ohio in which these worms were found post-mortem. We find another kind of worms epidemic in sheep; a large number of sheep die from parasites, but there were facts bearing upon this, showing the importance of this study. This whole matter of parasitic literature, or the relation of parasites to animals, is a curious thing, and we shall find more about it as we go on. But aside from those which live in both men and animals, there seems to have been very little attention given to this subject. We have the chickens dying from parasites in the same way. In Iceland, living as they do in close proximity with the dog suffering echinococci, the disease is transmitted to the owner, and we have the hydatid disease.

PROF. KELLICOTT.

I have not anything particularly to say. I have with me five or six distomes from the dog, and also a piece of the lung, in which are eight or ten masses of eggs. It is suggested we should work up certain things, and of course that is what we are trying to do. We hope to go on with feeding experiments, and if possible determine much in that way.

These eggs are perfectly smooth, five or six times the diameter of the blood-corpuscle, and yet they are scattered in bunches all over the thoracic wall. An interesting question is how they got there. We can find no young in the lungs, which indicates to me that there is a second host, and the dog must have swallowed that host.

UNJUST MALPRACTICE SUITS.

THEIR CAUSES AND PREVENTION.

(ABSTRACT.)

WM. ESTEP, M. D., LOYDSVILLE.

As a rule doctors are of the most respected class of a community. But we are compelled to say that they are not *all* honorable men, and this essay records certain dishonorable acts unworthy of the noble profession. . . .

I have lived in this county and practiced medicine for over fifty-three years. During this time there have been nine lawsuits against our most prominent practitioners for alleged malpractice. I have been a witness in eight of these cases, and can say that in every case the suit has been brought by or with the opinion of some medical man, calling himself a doctor, who has encouraged them into the belief that they have a case. Often the traitorous adviser is not to be found when the case comes to trial. In a trial recently held in our county the intelligent jury returned a verdict for the defendant in nineteen minutes. Not rarely it happens that the instigator of the suit proves himself against his will an admirable witness for the defense.

Here is an instance of a very unfortunate affair.

Some years ago an old man in our county was injured about the hip by being thrown from his wagon. He got up and assisted others who were with him, made secure his horses and moved about considerably before he was assisted to his home.

Dr. H. was called and pronounced it a sprain and contusion about the hip joint, stating that there was no dislocation. Another doctor was called soon after to attend to the daughter and examined the man. He stated that there was dislocation and called counsel. They differed, one making diagnosis of dislocation, and the other holding the opposite opinion.

The man was then advised to go to a city and consult an eminent surgeon, which he did. He was anæsthetized and examined, and after consultation of surgeons it was agreed that the hip joint was dislocated. Attempts at reduction, prolonged for over two hours, failed. Suit was brought against Dr. H., and during the trial I was with a colleague called by the defense. We testified that the injury was not a dislocation, but an intra-capsular impacted fracture of the neck. The depositions of the professors whom he had consulted in the city were used by the prosecution. They deposed in substance that the indications were that there was a dislocation of the head of the bone into the sacro-ischiatic notch. Attempts had been made to reduce the dislocation, first by breaking up all adhesions by prolonged passive motion, and then by the Reed method, and subsequently by forcible traction, etc.; all had failed. It was probable that the cup of the acetabulum was so filled up that it could not receive it, etc., etc. . . .

Judgment was rendered giving a verdict of $1100 for the prosecution, it costing Dr. H. about $1700, unjustly, as was proven.

The man died subsequently and an autopsy revealed the fact that the injury had been an intra-capsular fracture of the neck, and that there had never been any dislocation. . . .

I myself have been a victim of a suit instigated and encouraged by a colleague, a former partner. Through trickery and falsehood they got a verdict of $500, costs amounting to $300. . . .

A certain most estimable physician of this county was sued at the instigation of a member of the county society. The latter gentleman was promptly expelled, and the defendant acquitted of the charge.

No physician or surgeon is exempt so long as we have traitors in our ranks. The remedy is for the profession to stand by each other and never criticise the work of another, nor render an adverse opinion in the presence of interested parties.

APPENDICITIS.

THIRTY CONSECUTIVE OPERATIONS DURING ONE YEAR, WITH ONE DEATH.

DUDLEY P. ALLEN, M. D.

Prof. Surgery Western Reserve University. Visiting Surgeon to Lakeside Hospital and Charity Hospital, Cleveland, Ohio.

In presenting for consideration a subject which has been so thoroughly discussed as that of appendicitis, some excuse for so doing may reasonably be expected. My excuse is that I believe we will most justly appreciate the proper treatment of appendicitis by a complete statement of all cases which have come under the observation of one individual.

A year ago I published a paper containing a year's experience in operating for appendicitis. The present paper contains an account of those cases, operated from April 26, 1893, to May 3, 1894, being thirty in number.

Two of these cases were operated upon by my valued assistant, Dr. Wm. H. Nevison, and twenty-eight by myself. Eighteen were operated in the chronic, and twelve in the acute stage. In addition to this I have seen in consultation seven cases in which delay was recommended, and one case which was in a moribund condition when first seen, and which died about one hour later.

In another case which I saw in consultation, I diagnosticated a collection of pus in the right lumbar region, and advised an opening, which was made by my friend Dr. Humiston, and the case terminated by complete recovery.

Another case was that of a boy, dying with evidences of obstruction of the bowels, the whole pelvis, half way from the pubes to the umbilicus, being filled with pus. The physician in attendance had noticed nothing in any way indicative of appendicitis. An operation was strongly urged, although the patient was already in collapse, and the patient died some three or four hours later. At the autopsy it was found that the origin of this large collection of pus was an ulcerated appendix.

When the operation for appendicitis was first proposed it met an enthusiastic and wide reception. Doubtless many cases were operated which would have done better if left alone, either because no operation was necessary, or because the operation was poorly done. There has resulted what is not uncommon under similar circumstances, viz.: much adverse criticism of the operative treatment of appendicitis, and the question presses itself upon us if the pendulum of public opinion has not already swung too far in the direction opposed to operation. It is to aid in the solution of this question that I present an account of the accompanying thirty operations with one death. Inasmuch as the appended tables give a fair statement of the operated cases, it is needless to discuss them in detail. A few comments, however, will not be out of place.

The one case which died was that of a young man, seen in his first attack. Though the attack was somewhat severe, it seemed probable that the patient would recover from it. He did recover and was seemingly well, but was seen five or six weeks later in a second attack. This was not very violent, but he was positively advised to have an operation performed after the severity of the symptoms had abated. He was again seen in a third attack and similarly advised, but no operation was permitted until the seventh attack, which was six months after the original one. By this time the patient was in a decidedly serious condition, the adhesions were found to be very great, and the operation was one of extreme difficulty but was seemingly a success, and

the patient was supposed to be out of danger, when on the sixth day after the operation swelling of the left parotid gland became apparent. Two days later the parotid was thoroughly opened, before any abscess had formed, there being simply multiple minute points of breaking down tissue. In spite of every care the patient died on the fifteenth day.

This one case of death argues more strongly in favor of operation than almost any other. It is my positive belief that had an operation been permitted after the earlier attacks, the patient would have been alive to-day, rather than having died of a remote infection, which in all probability was due to the condition of the patient prior to operation.

Two other cases in which delay was recommended came to operation in subsequent attacks, and both recovered.

Thus during the year I have seen forty cases of appendicitis, thirty have been operated, and all but one have recovered. Besides these thirty, one was dying when seen. In one a large abscess was found and opened in a patient already in collapse, and it was not until the autopsy that its origin was found to have been in an ulcerated appendix. Three cases in which delay was advised were among those operated later. The remaining four cases are still alive, two of the four having suffered from repeated attacks, while two have been lost sight of.

The more carefully the histories of cases of appendicitis are looked into, the more frequently I am sure it will be found that there have been previous attacks. In my experience it is comparatively rare that there is no evidence of previous difficulty in the region of the appendix.

Very many cases operated as is supposed in the primary attack, will upon further questioning be found to have had previous seizures of pain of a greater or less degree of severity in this region.

In those cases where recovery has taken place without

operation, it is by no means certain that subsequent attacks may not occur and require an operation.

One case was seen during an attack of appendicitis of moderate severity, there being history of several previous attacks. Operation was recommended, but other medical counsel being sought the advice was not acted upon. When seen several weeks later, the patient was evidently suffering from obstruction of the bowels. Confidence in the first diagnosis, however, was so positive that in spite of the patient being in collapse from evident obstruction, at the urgent request of the family operation was undertaken. The appendix was found inflamed and ulcerated, and in addition to this it had encircled the entire cæcum, causing occlusion of the bowel and the subsequent symptoms of obstruction. After a most hopeless condition both at and following the operation, the patient made a complete recovery.

In the acute cases and in those in which pus has been present the method has been to pack off the abdominal cavity with iodoform gauze, and to leave the wound open. In those in which no pus has been found and when it has been possible, the appendix has been amputated, invaginated and closed by two or three rows of catgut, and after this the abdominal wound has also been closed without drainage. In cases where considerable collections of pus have been found, and ulcerations have been extensive, too great effort has not been made to secure and remove the appendix.

In some of these cases it has been evident that the appendix was entirely destroyed by sloughing. In others, to have found it, would have been to have opened widely the peritoneal cavity. I am convinced that where considerable collections of pus are present and there is danger in searching for the appendix of opening and infecting the general peritoneal cavity, it is wise not to push the effort too far. Of course if the appendix can be reached and removed it is highly desirable, but in some of these cases the ulcerative process entirely destroys the appendix, so that if the cavity

be thoroughly packed open the case will heal definitely by granulation.

In most of the cases a curved incision has been made parallel to and above Poupart's line. In one the incision was made in the linea semilunaris, and in another in the median line.

In one case an opening suggested to me by Dr. McBurney of New York was made. The ordinary incision was made through the skin, the external oblique muscle was divided parallel to its fibres, the internal oblique and transversalis were divided parallel to their fibres, and the peritoneum was divided in the same line with the integument. After the removal of the appendix each layer of muscles and the peritoneum were stitched together by catgut and closed without drainage. The method seemed a very good one in cases in which the disease was not of wide extent, making a secure cicatrix, but I should hesitate to adopt it in serious cases, since it does not give so extensive a field for operation.

Three of the cases had fistulous tracts remaining from former operations, and it was on account of these that the operations were undertaken. In these cases the appendix had not been removed in the primary operation, because of the condition of the patient making it seemingly unwarrantable to push the operation further. One of the cases was operated four years, one one year, and the third seven months following the original operation.

APPENDICITIS

No.	Nat. Age. Sex.	In consultation with	Date and place of operation	Stage in which operated.	History of previous attacks.	Incision.	Subjective Symptoms.
I E. H. G.	Am. 21 male.	Dr. D. H. McMillan, Orville, O.	Lakeside Hospital. April 26, 1893.	Between attacks.	Had 8 attacks during last year.	Over cæcum.	Localized pain over cæcum during attack
II C. S.	Ger. 27 male.	Dr. M. Borts.	Lakeside Hospital. April 28, 1893.	Second operation between attacks.	Recurrent attacks during year.	Over cæcum.	Tenderness when wound would close.
III F. H.	Am. 23 female.	Dr. I. N. Oakes, Ridgeville, O.	Lakeside Hospital. May 16, 1893.	Between attacks.	Recurrent attacks for 6 years.	Median incision	Tenderness over cæcum during attacks which had no connection with menstrual periods.
IV O.C.L	Am. 20 male.	Dr. F. W. Upson, Conneaut, Ohio	Lakeside Hospital. May 17, 1893.	Second operation between attacks.	Recurrent attacks during 16 months.	Linea semilunaris-	Tenderness over cæcum.

(CHRONIC CASES.)

Objective Symptoms.	Operation.	Appendix and Concretions.	Result.	Remarks.
No dullness; no induration — extremely tender during attacks.	No adhesions; appendix on anterior surface of cæcum; amputated appendix and invaginated stump with catgut sutures. Closed abdomen with silkworm gut sutures. No drainage.	Mucous membrane ulcerated and constricted near its base; no concretion.	R.	Wound healed absolutely by first intention. Left hospital 28 days after operation. No trouble since.
Fistula remaining after operation made 7 months before; abscess was drained but could not find appendix.	Adhesions from previous operation. Appendix on posterior surface of cæcum; ulcerated and in two parts; portion attached to cæcum ¼ in. long was trimmed and edges invaginated. Dissected out fistulous tracts. Tampon of gauze.	Distal portion appendix one inch long ulcerated and completely detached from cæcum.	R.	Wound healed by granulation. Patient left hospital 27 days after operation. Wound was entirely closed in about four months.
Nothing to be felt by external or vaginal examination.	Appendix constricted and closely adherent to cæcum its entire length; was dissected off and opening into cæcum closed with catgut. Closed abdominal wound with silkworm gut sutures; no drainage.	Appendix ulcerated and bent twice at right angles, forming almost complete strictures at these points; no concretion.	R.	Patient went on nicely for a few days, then developed symptoms of peritonitis. Was in very bad condition for several days. Wound suppurated superficially. Patient made complete recovery.
Fistula remaining after operation made one year previously when appendix was not found.	Followed sinus down to appendix — amputated — sewed stump with catgut. Packed wound with gauze.	Appendix ulcerated completely thro' and only a stump about ½ inch long remained. No concretion.	R.	Uninterrupted recovery. Wound entirely healed in about 3 months. Has regained perfect health.

APPENDICITIS

No.	Nat. Age. Sex.	In consultation with.	Date and place of operation.	Stage in which operated.	History of previous attacks.	Incision.	Subjective symptoms.
V J. G.	Am. 28 male.	-	Charity Hospital. Oct. 6, 1893.	During an attack	4 attacks in 2 years	Over cæcum.	Tenderness over cæcum during attacks.
VI C.H.G	Am. 33 male.	Drs. F.W. Fletcher and G. D. Palmer, Geneva, Ohio.	Lakeside Hospital. Oct. 20, 1893.	Between attacks.	Recurrent attacks during 6 months.	Over cæcum.	Continued tenderness on pressure over cæcum.
VII E. S.	Am. 22 male.	Dr. C. D. Noble, Oberlin, Ohio.	Residence. Oct. 26, 1893.	During acute attack.	Had one attack two years ago.	Over cæcum.	Great tenderness in region of appendix.
VIII W.H.L.	Am. female.		Lakeside Hospital. Nov. 15, 1893.	Between attacks.	Recurrent attacks during 8 months	Over cæcum.	Tenderness on deep pressure. No connection with monthly periods.
IX H. D.	Am. 17 male.	Dr. G. C. Ashmun.	Residence. Dec. 2, 1893.	During a mild attack.	Had 7 attacks in 4 months.	Over cæcum.	Continued tenderness over region of cæcum.

(CHRONIC CASES.)

Objective symptoms.	Operation.	Appendix and concretions.	Result.	Remarks.
Slight resistance and extreme tenderness on pressure over cæcum.	No adhesions; amputated appendix. Sewed stump with catgut; closed abdominal wound with silk-worm gut sutures—no drainage.	Appendix swollen and mucous membrane ulcerated. No concretion.	R.	Uninterrupted recovery. Wound healed by first intention.
Slight induration—no dullness except during attacks.	Appendix amputated and stump sewed with catgut. Appendix was adherent to cæcum and had ulcerated through into cæcum about its middle — closed opening with catgut. Gauze tampon.	Appendix ulcerated and constricted. No concretion	R.	Uninterrupted recovery. Entirely healed in about 6 weeks.
Induration and dullness, and very tender on pressure.	Found abscess containing several ounces of pus. Irrigated and packed with gauze.	Appendix not found. No concretion.	R.	Sinus remained for several weeks after operation.
Nothing to be felt. Vaginal examination showed uterine appendages normal.	No adhesions. Amputated appendix. Sewed stump with catgut. Closed abdominal wound with silk-worm gut. No drainage.	Appendix greatly thickened. No concretion.	R.	Uninterrupted recovery — healed by first intention. Left hospital 28 days after operation.
Extensive induration and dullness. Very tender during attacks.	Omentum and cæcum in a mass of adhesions. Appendix has been on anterior surface of cæcum—only granulation tissue to be found. Sewed opening into cæcum with catgut.	Nothing left of appendix but a few shreds. No concretion.	Died 15 da. after operation.	Wound suppurated profusely. 8th day after operation developed abscess of left parotid which was opened and drained. Patient died of general infection.

APPENDICITIS.

No.	Nat. Age. Sex.	In consultation with	Date and place of operation.	Stage in which operated.	History of previous attacks.	Incision.	Subjective symptoms.
X P. A.C	Am. 24 male.	Drs. G. A. Orwig and G.W. Stevenson.	Charity Hospital. Dec. 4, 1893.	During attack when patient was in collapse.	Had several attacks during 1½ yrs.	Over cæcum.	Pain over entire abdomen at time of operation.
XI M. A.	Ger. 48 female.	Dr. W.H. Humiston.	Dr. Humiston's Hospital. Dec. 6, 1893.	Quiescent stage.	Attacks during previous 3 months	Over cæcum.	Dull pain over cæcum greatly increased after any exertion.
XII I. S.	Am. 21 male.	Dr. I. A. Elson, Smithville, Ohio.	Residence. Dec. 13, 1893.	During an attack.	Slight attacks lasting a day or two for a month before operation.	Over cæcum.	Dull pain between attacks; very acute during attacks.
XIII J.M.G	Am. 37 male.	Dr. C. S. Hiddleson, Atwater, Ohio.	Charity Hospital. Dec. 15, 1893.	During quiescent stage.	3 severe attacks during 4 years.	Over cæcum.	Tenderness on deep pressure over cæcum.

(CHRONIC CASES.)

Objective symptoms.	Operation.	Appendix and concretion.	Result.	Remarks.
Extreme tympanites; no movement could be obtained; had all appearances of patient suffering from obstruction of bowels; had seen patient two months previously and diagnosticated appendicitis.	Appendix very long and was wrapped completely around cæcum at entrance of ileum and bound by adhesions, thus producing occlusion of the bowel at this point; dissected off and amputated appendix, closing opening into cæcum with catgut. Tampon iodoform gauze.	Appendix 4½ inches long; catarrhal condition of mucous membrane; no concretion.	R.	Was in very low condition for a week after operation; bowels moved 4th day after operation; had two relapses from eating mince pie and turnips; wound suppurated; entirely healed 7 weeks after operation; left hospital 37 days after; no further trouble.
Extensive induration, dullness and tenderness on pressure.	Cæcum and omentum in a mass of adhesions; appendix destroyed, with exception of short stump; sewed opening into cæcum with catgut. Tampon of gauze.	Only small stump of appendix remained; concretion size of a date seed.	R.	Uninterrupted recovery. Wound healed in 4 weeks. Patient left hospital 25 days after the operation.
Induration and dullness over cæcum. Pain over McBurney's point.	Cæcum adherent to abdominal wall; appendix lay anteriorly in a mass of adhesions; was dissected off and amputated. Opening into cæcum sewed with catgut.	Appendix ulcerated, and about its middle was tightly constricted	R.	Uninterrupted recovery. Wound entirely healed in six weeks. Operated by Dr. Nevison.
Indistinct induration; no dullness. During attacks had distinct tumor and dullness over cæcum.	Appendix in adhesions between pelvic wall and cæcum. Amputated and sewed with catgut. Tampon iodoform gauze.	Appendix greatly thickened with catarrhal condition of mucous membrane.	R.	8th day patient developed phlebitis of right leg which subsided in a few days. Wound entirely healed about 4 weeks after operation.

APPENDICITIS.

No.	Nat. Age. Sex.	In consultation with.	Date and place of operation.	Stage in which operated.	History of previous attacks.	Incision.	Subjective Symptoms.
XIV F.N.R	Am. 40 male.	Dr. J.P. Sawyer.	Residence. Mar. 14, 1894.	During severe attack.	7 attacks during last 6 or 7 years.	Over cæcum.	Great pain during attacks.
XV A. W. M.	Ger. 40 male.	Dr. A. O. Huntley, N. Bloomfield, Ohio.	Lakeside Hospital. Mar. 20, 1894.	During quiescent stage.	1st attack 9 years ago. 2d attack in March, 1893. 3d attack Sept., '93, not able to do any work since.	Over cæcum.	Pain during attacks. Since last attack in Sept., 1893, has had continual tenderness aggravated by slightest exertion.
XVI W.S.	Ger. 30 male.	Dr. J. H. Lueke.	Lakeside Hospital. April 26, 1894.	During an attack.	Attacks during two years.	Over cæcum.	Of late has constant pain in region of cæcum so that he is unable to do any work.

(CHRONIC CASES.)

Objective Symptoms.	Operation.	Appendix and Concretions.	Result.	Remarks.
Induration and dullness and great pain on slightest pressure.	Opened general abdominal cavity. Found abscess to outer and posterior side of cæcum. Could not find appendix and thought best not to subject patient at present stage to the extensive tearing of adhesions which its search would have necessitated. Tampon of gauze.	Appendix not found; no concretion.	R.	On April 1, temperature went up and pain returned, necessitating the introduction of the finger into the wound which was followed by an escape of pus. Patient now rapidly improving.
Tenderness and resistance on deep pressure; no dullness.	Appendix on anterior surface of cæcum, no adhesions. Amputated and sewed with catgut.	Appendix bent at right angles about middle and was impervious in distal portion. Catarrhal condition of mucous membrane; no concretion.	R.	Uninterrupted recovery; wound healed by first intention. Patient left hospital 30 days after operation.
Extensive induration and dullness reaching to McBurney's point.	Omentum and cæcum in a mass of adhesions. Appendix situated at lower and under surface of cæcum and extending upward and inward behind ileo-cæcal valve. Amputated and sewed with catgut. Iodoform gauze tampon.	Appendix greatly swollen and completely occluded at its base. Coats greatly thickened by chronic inflammation.	R.	Patient still in bed. Has had no bad symptoms of any kind.

APPENDICITIS.

No.	Nat. Age. Sex.	In consultation with.	Date and place of operation.	Stage in which operated.	History of previous attacks.	Incision.	Subjective Symptoms.
XVII F. H.	Am. 27 male.		Lakeside Hospital. May 2, 1894.	During quiescent stage.	Attacks during a period of 17 years. Operated in 1890.	Over cæcum.	Constant tenderness and pain; quite severe just before discharge of pus.
XVIII E. B.	Ger. 25 male.	Dr. C. A. Hamann.	Lakeside Hospital. May 3, 1894.	During quiescent stage.	Attacks during period of two years.	Over cæcum.	Tendernessduring attacks. No pain at time of operation.

(CHRONIC CASES.)

Objective Symptoms.	Operation.	Appendix and Concretions.	Result.	Remarks.
Cicatrices and fistula remaining from operation 4 years previous. Fistula closes and opens with a slight discharge of pus about every 6 weeks. Induration and dullness in cæcal region.	Traced fistula down to the appendix which lay behind and to outer surface of cæcum. Sewed opening in cæcum with catgut. Operation very long and difficult because of extensive adhesions remaining and involving everything in a solid mass. Gauze tampon.	Appendix in two parts. Distal portion about one inch long, greatly thickened, ulcerated and full of pus. Approximal portion about ¼ inch and extremity open.	R.	Patient making a rapid recovery.
No dullness. Could feel what seemed to be a thickened appendix.	Incision through skin and external oblique parallel to fibres of external oblique; divided internal oblique parallel to its fibres; and transversalis and peritoneum parallel to skin incision. Appendix lay anteriorly; adherent to cæcum by dense adhesions. Amputated and sewed with catgut. Layers of abdominal wound stitched with catgut	Appendix greatly thickened; with catarrhal condition of mucous membrane.	R.	Patient making an uninterrupted recovery.

APPENDICITIS

No.	Nat. Age. Sex.	In consultation with.	Date and place of operation.	Stage in which operated.	History of previous attacks.	Incision.	Subjective symptoms.
XIX F. S.	Am. 25 male.	Dr. H. Wilson, Oberlin, Ohio.	Residence. June 16, 1893.	Acute. 6 days.	None.	Over cæcum.	General abdominal pain becoming localized on third day.
XX M. C. D.	Am. 7 female.	Drs. J. E. Darby, G. C. Ashmun, and H. K. Cushing.	Residence. June 18, 1893.	Acute. 6 days.	None.	Over cæcum.	Pain behind crest of ileum extending upward toward kidney and liver.
XXI E. B.	Am. 16 male.	Dr. H. Wilson, Oberlin, Ohio.	Residence. July 1, 1893.	Acute. 6 days.	None.	Over cæcum.	General pain becoming localized on second day.
XXII A. L.	Am. 13 female.	Dr. H. Wilson, Oberlin, Ohio.	Residence. Aug. 24, 1893.	Acute. 8 days.	None.	Over cæcum.	General pain localized on second day.

(ACUTE CASES.)

Objective symptoms.	Operation.	Appendix and concretion.	Result.	Remarks.
Tympanitic; tenderness and dullness over cæcum and distinct induration.	Found abscess containing several ounces of pus; amputated appendix, but base was so gangrenous that it could not be stitched and was simply tied. Tampon of gauze.	Appendix gangrenous and perforated about middle; no concretion.	R.	Uninterrupted recovery. Wound entirely healed in about 7 weeks.
Dullness over cæcum; nothing to be felt.	Appendix full of a soft material; did not present appearances of inflammation; amputated and sewed with catgut. Appendix lay anteriorly and was crowded backward below the cæcum.	Appendix 4½ in. long. Contained a small concretion.	R.	Uninterrupted recovery. Wound healed by first intention; no further trouble, and now in excellent health.
Tympanitic; dullness and induration in region of cæcum; great pain on pressure.	Found abscess between cæcum and pelvic wall containing several ounces of pus. Appendix lay on anterior surface; amputated, but could only draw together lightly with sutures of catgut, as base was so softened. Tampon of gauze.	Appendix large and gangrenous; perforated near base; no concretion.	R.	Uninterrupted recovery. Wound discharged profusely for a time, but healed entirely in about 2 months.
Moderate tympanites. Slight resistance in region of cæcum. Most marked above ileo umbilical line. Pain on pressure.	Abscess containing several ounces of pus. Appendix tore from cæcum and could not reach the base. Tampon iodoform gauze.	Appendix gangrenous and perforated. No concretion.	R.	Wound discharged profusely. Patient recovered completely.

APPENDICITIS.

No.	Nat. Age. Sex.	In consultation with	Date and place of operation.	Stage in which operated.	History of previous attacks.	Incision	Subjective symptoms.
XXIII J. A. H.	Am. 21 male.	Drs. A.O. Spence and G. C. Ashmun.	Charity Hospital. Aug. 25, 1893.	Acute. 18 days..	None.	Over cæcum.	Taken with pain in umbilical region. More or less soreness over entire abdomen. Pain finally became localized to cæcum.
XXIV F. S.	Ger. 12 female.	Dr. G. A. Orwig.	Lakeside Hospital. Oct. 20, 1893.	Acute. 6 days.	None.	Over cæcum.	General abdominal pain, becoming localized on day before operation at McBurney's point.
XXV R. A.	Am. 20 male.	Dr. F. W. Upson, Conneaut, Ohio.	Residence. Jan. 10, 1894.	Acute. 10 days.	None.	Over cæcum.	Cramps in abdomen; became localized on 3d day to region of cæcum.
XXVI G. B.	Irish. 17 male.	Dr. A. J. Cook.	Lakeside Hospital. Jan. 19, 1894.	Acute. 8 days.	None.	Over cæcum.	General pain localized on 2d day.

(ACUTE CASES.)

Objective symptoms.	Operation.	Appendix and Concretions.	Result.	Remarks.
Induration and tenderness on pressure over cæcum.	Cæcum and omentum in mass of adhesions containing appendix, and a few drachms of pus. Tissues were so disorganized that opening into cæcum could not be closed with sutures. Gauze tampon.	Appendix destroyed. Only few shreds remaining. No concretion.	R.	Uninterrupted recovery. Left hospital 31 days after operation.
Induration and dullness over cæcum. Great pain on pressure.	Abscess containing ½ pint pus. Appendix on anterior surface of cæcum. Amputated and could not sew stump because tissues tore under sutures. Gauze tampon.	Appendix gangrenous and perforated. No concretion.	R.	Profuse discharge. Patient allowed to get up middle of Dec. Went home in Jan., sinus still remaining.
Distinct dullness and induration over cæcum. Tender on pressure.	Came on abscess containing ½ pint pus. During irrigation appendix floated out, having become entirely detached. Opening in cæcum not found. Gauze tampon.	Appendix gangrenous and entirely detached. No concretion.	R.	Uninterrupted recovery.
Indurated mass and dullness over cæcum. Pain very acute.	Abscess containing several ounces of pus. Appendix not found. Gauze tampon.	Appendix not found. No concretion.	R.	Free discharge for 3 weeks. Patient left hospital 8 weeks after operation, entirely healed 14 weeks after operation. No induration or tenderness remaining.

APPENDICITIS.

No.	Nat. Age. Sex.	In consultation with.	Date and place of operation.	Stage in which operated.	History of previous attacks.	Incision.	Subjective Symptoms.
XXVII E. J.	Am. 19 female.	Dr. P. H. Sawyer.	Residence. Feb. 1, 1894.	Acute. 20 days.	None.	Over cæcum.	General abdominal pain becoming localized on 2d day.
XXVIII J. Y.	Ger. 23 male.	Dr. F. H. Acker.	Lakeside Hospital. Feb. 10, 1894.	Acute. 5 days.	None.	Over cæcum.	General abdominal pain; localized on second day.
XXIX R. S.	Ger. 12 female.	Drs. C. Baker and W. H. Humiston.	Residence. Mar. 27, 1894.	Acute. 8 days.	None.	Over cæcum.	General abdominal pain; localized on second day.
XXX S. A. H.	Eng. 43 female.	Dr. J. E. Darby.	Lakeside Hospital. May 3, 1894.	Acute. 17 days.	None.	Over cæcum.	General abdominal pain becoming localized on third day.

(ACUTE CASES.)

Objective Symptoms.	Operation.	Appendix and Concretions.	Result.	Remarks.
Some tympanites. Extensive induration and dullness, extending posteriorly and upward toward liver.	Abscess between cæcum and pelvic wall containing small amout of pus. Appendix to outer surface of cæcum. Amputated and attempted sewing with catgut, but tissues tore under sutures. Gauze tampon.	Appendix ulcerated and perforated about the middle. No concretion.	R.	Profuse suppuration. April 18 removed ¾ quart serum from left pleural cavity. Gradual improvement followed. Patient able to be around, but sinus still discharges.
Extensive dullness and induration over cæcum and extending to McBurney's point. Great tenderness on pressure.	Abscess containing ½ pint of pus extending behind cæcum and pushing its way upward toward liver. Iliac artery could be felt pulsating at bottom of cavity. Tampon of gauze.	Appendix not found. No concretion.	R.	Uninterrupted recovery. Patient left hospital in four weeks. Wound entirely healed in about seven weeks. No trouble since.
Marked induration and dullness over cæcum. Tender on pressure.	Cæcum adherent to abdominal wall. Abscess between cæcum and pelvic wall and dissecting posteriorly. Could not find appendix. Tampon of gauze.	Appendix not found. No concretion.	R.	Uninterrupted recovery. Small point of granulation remaining 1 month after operation. Operated by Dr. Nevison.
Induration and dullness extending to McBurney's point.	Abscess behind cæcum dissecting downward toward pelvis and also upward toward liver. Sewed opening in cæcum with catgut. Gauze tampon.	Only a few shreds of appendix remaining. No concretion.	R.	Patient still in hospital. Has had no bad symptoms of any kind.

CONCLUSIONS.

There are four points on which I have reached a pretty definite conclusion in my own mind.

1st. Though many cases of appendicitis may recover without surgical aid, it is by no means an easy matter to distinguish these from those which are more serious, and it is of vital importance if surgical counsel is to be summoned, that it should be called before the disease is so far advanced as to render the operation hopeless.

2d. Operations for appendicitis, though often easy, are at times extremely difficult, requiring the skill necessary for the most critical laparotomy, and I think it but right to say that it would be better in many cases to trust to nature than a poor operator.

3d. Careful examination will disclose the fact that many patients suffering from what is supposed to be a primary attack of appendicitis have had previous difficulty in this region, and an examination of the appendices removed will demonstrate positively the existence of long standing inflammation.

4th. Operations in the acute stage of a primary attack are beset with danger, and it is important they should be undertaken before the patient is in collapse, before peritonitis has become general, and before the patient is thoroughly septic.

Operations upon recurrent cases, though sometimes of extreme difficulty, are in most instances if in the hands of a skillful operator far less dangerous than the disease itself, and in such cases the question of operation should receive careful consideration.

DISCUSSION.

DR. GILLIAM.

The question is, first, whether operations for appendicitis are justifiable in a great many cases, and second, what class of cases we should operate upon. Now, I have been watching this thing with considerable interest, inasmuch as I have been interested in abdominal surgery, although not specially in this line, and after looking the question over for a good while I came to the conclusion that for about eighteen months past there has been a little too much of a craze for operation. I think the time will come when we will not operate so freely. The time will never come when we will cease to operate, but the time will come when we shall learn what cases to operate upon and what ones to leave alone. I think I have seen from thirty to fifty cases, and of that number I can only remember two cases not operated upon that terminated fatally and that gives almost as good result as the doctor has had in his operations. There is no doubt that a great many cases of appendicitis have escaped our attention, because we used to call them cases of perityphlitis; they were in some cases called typhoid fever, and in some cases simply peritonitis, etc. But of the cases which I have seen and upon which I have operated, there was one death, and that case went with almost lightninglike rapidity. The intestines sloughed away, letting the contents of the bowel out into the peritoneal cavity, so in a short time it was full of pus and fecal matter. We thought we would give the patient every opportunity possible, and operated, letting out a lot of disagreeable fetid matter. The patient died in a very short time. That is the only case which I have lost in this way. In constantly and rapidly recurring cases of appendicitis I think our duty is to operate, and to select the time between attacks for operation.

DR. N. P. DANDRIDGE.

I would like to say a word or two upon the subject, as it is one which has engaged my attention more or less during the last few years. I agree with the author, particularly where he urges not prolonging too long the search for the appendix. This I think is an exceedingly dangerous procedure. The difficulties of determining just when to operate in individual cases I think everybody must acknowledge,

and certainly the remarks made by different speakers indicate this is a very general experience. That these cases are masked and very insidious brings to my mind some instances. Only yesterday I operated upon a case I had watched for some time. It commenced on Wednesday last. I saw the case first on Saturday, and then there was a well-defined resistance in the right iliac fossa with marked pain and a slight fever, ranging from 100⅘° to 102°. The boy did not feel bad, and did not present the appearance of being very sick. As the fever continued and the local condition did not subside, I advised operation. We found the appendix had sloughed, and the terminal portion was gangrenous. This had gone on without producing any marked increase in the symptoms or temperature, and certainly the delay of two or three days added to the gravity and danger of that case. I do not think any one who saw the case would hesitate to say the boy was much safer with the operation than without it.

Another fact brought out is that many of these cases have really had their origin a long time before the attack for which the surgeon is called. In this case the condition of the parts, the heavy masses of lymph and the induration we found, certainly indicated a pathological process that was hardly likely to be developed in the few days the case was under observation.

I think the paper has been a very good one, and the discussion has also been very important. It is just this sort of discussion, which brings surgeons face to face with these cases, that will lead to some conclusion. The surgeons are not so anxious to operate in these cases as they are sometimes charged. There is another point which I do not think is sufficiently fully appreciated. It was brought out in a paper read at the Medical Association of New York last November, and that is the frequency of hernia following these operations One instrument-maker said that in a short time he supplied six dozen trusses for the hernia following these operations. This is an important point.

DR. KINSMAN.

There is no one who denies the importance of this subject, but there is either a failure to render the matter of diagnosis clear, or else a deception, in placing everything diseased contained in the abdomen into a basket and calling it the result of appendicitis. A very striking feature is this, that in

cases of acute appendicitis, if the operation is made during the paralysis of the bowel, it is almost always fatal. Now, it is a fact, although we do not know why it is continually so, that in these cases as soon as there comes to be a distension of the abdomen there becomes an utter and complete paralysis of the bowel, and then by auscultation there is no movement recognized. That is one of the conditions under which Richardson advises against operation, and yet he says those cases are almost always associated with trouble about the right iliac fossa. The pain is not localized. I have seen several cases in which I could not recognize any tumor whatever, although the McBurney point was clear enough. In a case that recently died the most careful auscultation showed complete paralysis of the intestine. Now, what can we rely upon as a positive evidence of appendicitis? We cannot rely upon tumor, because you do not always find it; you cannot rely upon localized pain, because it is quite as often clear across the abdomen and up over the spleen as in the right iliac fossa. Thus we cannot rely upon those things ordinarily placed before us. And then again, is it, as we are taught to believe, fair to consider all these cases appendicitis which originate in the right iliac fossa, and then operate? That is the question. I wish the surgeons would answer those questions, for they are important to us. I had a case that lived twenty-one days without a particle of escape from the bowels of gas or anything else, and the patient recovered. I advised against operation, and said as long as the bowels were paralyzed it was my duty to so advise if I followed Richardson, and I must follow him because there is no better authority. The child recovered, and has since had a relapse. I have advised an operation in the quiescence, because I find surgeons are almost unanimous on that subject. Dr. Murphy has had a large success, but the peculiarity of his cases is that a large number of them were already suppurating, and the amount of it was simply the incision of an abscess and treating it antiseptically. I never operated, and never expect to, but I have been interested in these cases and have been led to believe that more of them have gotten well than is usually thought. If we are to take the view that the so-called cases of idiopathic peritonitis take their origin from this, we have then been seeing cases of appendicitis getting well all our lives.

DR. ALLEN.

I have very little to say, but I wish to enter a protest against the interpretation that the surgeon should be considered as thinking every case should be operated upon. I do not think I am more ready to operate for appendicitis than other surgeons are, but I do believe it is a mistake to hold that surgery is not a very desirable method of caring for many cases of appendicitis, and I have been called many times to operate in cases in which the intestines were so distended that the operation was utterly hopeless. Again, when an abscess has broken into the abdomen, the operation is hopeless. When the bowel is distended, it is usually hopeless. Then the surgeon has been called too late for operation. I think that everybody who has had to do with appendicitis is also in great doubt as to when to operate. Dr. Richardson is a personal friend of mine, and only a few weeks ago I had a conversation with him, and he said, "The more I see of appendicitis, the less I know about it." Now, so far as diagnosis is concerned, I have this to say, I have never yet made an error in diagnosis; that is, every time I have operated for appendicitis I have found the condition I operated for. The only way to take care of appendicitis is to consider whether or no you will have an operation, and the surgeon if necessary should make that operation before the patient is utterly hopeless either with or without an operation. I see appendicitis exclusively in consultation; I do not see primary cases. Many of them are hopeless with or without operating. Others have attacks one after another, and have never actually recovered from the first attack. There is, then, evidence of appendicitis existing for years. I believe there are two things surgeons should protest against: First, that they wish to operate upon every case they see; it is not the case. Second, that the case should be left until hopeless before they are asked to operate.

DR. KINSMAN.

I have the profoundest respect and confidence in Dr. Allen, and I would desire, after having read as carefully as I have, to have him tell the points upon which he relies for diagnosis.

DR. ALLEN.

I am not able to state that, and I do not believe any surgeon can give definite rules, but a few rules I feel are pretty safe. I have only seen one young man with pain in the right iliac fossa, of a sort that you may expect in appendicitis, in which I have not found an appendicitis. In women it is more difficult, because you have to distinguish it from salpingitis. In one young man I refused to operate; I cannot say why I refused, but it seemed like a case which should not be operated upon; and a few days afterward he passed a piece of bone. That is the only exception I have seen. The condition becomes more difficult as you approach middle life. I have been repeatedly asked to operate upon those of middle life or more advanced, but have refused to do so. The only thing which has kept me from doing so is that in almost all those cases you will find a history of constipation and a difficulty of movements of the bowels. My attention was most markedly drawn to that from a man in the hospital with ulceration of the leg. I decided not to operate, and he came to be almost in collapse, and I directed them to give him salts until his bowels moved or he died. His bowels moved and he got well. Further than that I am unable to lay down rules, but I believe in young people with pain in that region you will always find it is appendicitis. I do not believe the surgeon lives who can lay down absolute rules as to diagnosis and indications for operation.

ising and impracticable for the same reason. Injection meant the risk of embolism. Excision implied a perilous, bloody performance with profound shock. Peripheral ligation would have left a diseased external carotid, showing incompleteness, or recurrence, or both.

It was decided to tie the common carotid for three reasons:

1. The attenuation of the walls of the external branch incapacitated it for the reception of a ligature.

2. The engorgement of the right eye and lids showed how readily the collateral circulation through the internal branch might spoil the result, if only the external were ligated.

3. The facility with which the common trunk could be tied.

He was prepared by shaving and disinfecting the scalp. The head and neck were scrubbed with green soap, washed with ether, alcohol and sublimate water, and a bulky gauze dressing was applied.

Operation was performed at the clinic at the hospital on January 26, 1894. Ether was used as an anæsthetic. The usual incision was made along the anterior border of the sterno-mastoid muscle. Its center was opposite the cricoid cartilage. The sheath, having been exposed, was incised at the point of crossing of the omo-hyoid muscle, the latter being hooked downward to give more space. No. 10 silk, which had been prepared by boiling and by soaking in alcohol, was used for ligature. The pulsation in the tumor at once ceased after tying the vessel. The wound was closed in the usual way.

He was discharged from the hospital February 16th, the wound having healed. The tumor had diminished in size and the discoloration of the skin had subsided. Up to this time there has been no sign of recurrence.

A CASE OF ANEURISM BY ANASTOMOSIS.

JEFFERSON C. CROSSLAND, A. M., M. D., Zanesville.

PRESENTATION OF CASE.—The history of this man, N. B., is as follows: Æt. 60, family history good, enlisted January 13, 1862, in Company F, O. V. I. In February following he contracted chronic diarrhœa. Later in the same year he contracted chronic rheumatism and ague. He remained in the service three years. There is no history of intemperance, syphilis, wound or violence. The first notice of a morbid condition at the seat now occupied by the disease was soon after returning from the army. It consisted then of a round tumor about the size of a small pea. What we find now is an L-shaped aneurism by anastomosis. The tumor is three inches in greatest length, and one and a half inches in greatest width. It is situated just to the right of the median line, over the upper and posterior part of the parietal bone, between the sagittal suture and temporal ridge. The tumor is irregularly L-shaped, bluish in appearance, doughy to the feel, and pulsating, tenderness in some portions extreme. The scalp covering it is extremely thin in places. The *bruit de souffle* is very characteristic. There is extensive absorption of the skull underlying the tumor. The entire outer plate seems to be removed. The afferent vessels are the temporal posterior auricular and occipital arteries. The efferent vessels are chiefly the frontal veins.

The pathological change involves all the arteries and veins, and the capillaries of the scalp, but is especially

marked in the temporal arteries and frontal veins. The temporal arteries, especially the right one, are tortuous and dilated. The frontal veins are enlarged. They unite and discharge the bulk of their blood into the left angular artery. A point to be observed is that while the aneurism is situated to the right of the median line and fed mainly by the right temporal artery, it is drained mainly by veins carrying the blood to the left side. The vessels, notably the temporal arteries and frontal veins, have channeled the skull.

SUBJECTIVE SYMPTOMS.—There is cephalalgia, especially in the right frontal region, noises in the head, especially in the right ear, compared by the patient to the singing of a boiling tea-kettle, and increased when the tumor is more painful. There is a variable amount of pain, and extreme tenderness in portions of the tumor. The patient has suffered from vertigo, beginning soon after army service, and increasing in frequency and severity. Recently there are occasionally some disturbances of vision.

PREVIOUS TREATMENT.—About two years ago this man came to me when he was suffering extreme pain and vertigo. Operative interference was decided upon, and consisted in ligating all the arteries feeding the aneurism at a distance of from two to three inches from the tumor. The effect was a great amelioration of the painful and distressed condition. Pulsation was greatly diminished, but at no time entirely absent. Persistent effort to perfect the relief was made by the use of continuous pressure, which seemed to be of little if any utility.

WHAT TREATMENT IS NOW INDICATED?—From twenty-six cases of this form of aneurism located on the face and head, and recorded in Ashhurst's Surgery, the following results were obtained from carotid ligation: Thirteen cured, eight not cured, five died. In this case, the communication being bilateral, we may say carotid ligation is impracticable. Compression of the temporals and the zygoma renders pulsation in the aneurism almost imperceptible. It

would seem therefore that ligation at this point, together with ligation of the other efferent arteries at as remote a point as possible, was indicated. There would in all probability be a recurrence, but the operation would for a considerable period afford the patient comparative freedom from pain and vertigo, and retard the ravages of the disease.

REMARKS.

This case seems to be exceptional in two particulars, viz., the age of the patient and the duration of the disease. In the tabulated cases referred to, the oldest patient by far was fifty-three, and the duration of the disease twenty-four years, which is several times the duration in any other case except one case of congenital aneurism in a patient of twenty-three.

This man is a pensioner rated at ten dollars per month for rheumatism. Is not this man totally disabled so far as manual labor is concerned, in consequence of this disease?

Taking into consideration this man's history, and the predisposing character of his army diseases, viz.: chronic diarrhœa, chronic rheumatism, and malaria, the development soon after of this disease, is not this aneurism clearly traceable to army sickness and exposure?

GASTROSTOMY—A NEW METHOD.

M. STAMM, M. D., FREMONT.

Professor of Operative and Clinical Surgery, University of Wooster, Cleveland, Ohio.

The recent successful results of gastrostomy, thanks to improved methods, have made it a well-established operation in cases of cancerous or cicatricial stricture of the œsophagus, and have prompted us to operate at an earlier time than in former years. Before the antiseptic period, out of twenty-eight cases one only recovered, or, at least, lived forty days after the operation. Since that time more fortunate results have been obtained, and it may now justly be maintained that a fatal issue is principally due to the fact that the operation has not been resorted to before the patient was too much reduced in strength.

Having eliminated the dangers of sepsis, the next object was to overcome some further sources of danger or annoyance. One important point in my mind would be to lessen in some very feeble cases the effect of shock after operation by feeding the patient as soon as possible through the fistula. The next would be to prevent the oozing of food or gastric juice from the stomach, which would have a tendency to corrode and infect the wound. Quite a number of methods have of late been introduced with a view to do away with these sources of danger.

Hahn's method has for some time found favor with quite a number of surgeons. It consists in fixing the stomach to an opening made at the eighth intercostal space on the left side so that the ribs would perform the function of a valve.

It was, no doubt, an improvement over the older methods, but in two cases operated upon by Von Hacker, ulceration of the ninth costal cartilage resulted, and had these cases lived for a longer time some serious mischief would very probably have occurred. Von Hacker, after this, tried to overcome the leakage from the fistula by using the left rectus abdominis muscle for the formation of a sphincter, and was able to report twelve cases operated upon in that manner; the stomach, with the exception of one case, was not opened before forty-eight hours. All the cases recovered from the effect of the operation, but he had to use an inflatable double rubber bulb to prevent leakage.

Girard also makes a sphincter from the rectus muscle. Parallel to the operation wound he dissects out two strands of muscle-fibre about the thickness of a finger. These bands are crossed laterally and the stomach drawn through the sphincter-like opening.

Ssabanejew makes an incision of two to three inches along the left lower border of the ribs, beginning from the end of the ninth rib. He then pulls out the stomach by catching up a fold with a pair of intestinal clamps, and makes another incision near the sternal end of the sixth rib, one-half to one inch to the left of the mammillary line. In a blunt manner he passes from the first incision to the second through the soft parts, forming in this manner a tunnel. The parietal peritoneum is then stitched to the serous coat of the stomach at the basis of the fold. The apex of the fold after having been pulled through the tunnel is then stitched to the second incision. A small incision afterward is made into the stomach and a drainage tube introduced.

Kocher's method is somewhat similar to the one above. He makes a vertical incision about four inches long, two inches above and to the left of the umbilicus, then he draws out a part of the stomach for about four inches. After closing the abdominal opening to about two inches he stitches the stomach to the fascia and peritoneum with continued suture,

and then makes a channel in the manner adopted by Ssabanejew.

A procedure which of late has been highly extolled by some surgeons, and which so far has really given excellent results, is Witzel's method. Prof. Keen, of Philadelphia, in a recent article claims that it had reached such a state of perfection that it could be very little improved. From the description of his case, however, I see that he fed his patient for two days by rectal enemata, probably from fear that fluids might ooze out through the wound and produce infection. And yet, I think that prompt feeding through the tube is a very important factor in some feeble cases, at least it impressed me so in a case which I operated upon, after Hahn's method, a few years ago, when patient was *in extremis*. It was a case of cictricial stricture caused by swallowing nitric acid; patient died from shock about twenty-four hours after operation, and I still feel that prompt feeding through the stomach might have averted the fatal result.

Witzel's operation consists in establishing a canal from the walls of the stomach. A large surface of the stomach is drawn out through the external wound, a small incision is made into the stomach to admit a rubber tube of the thickness of a lead pencil. This tube is stitched to the stomach with a catgut suture, whilst the upper end is extended to project from the abdominal wound. Two parallel folds from the stomach are then taken up to envelop the tube, the free margins of which are stitched together by three or four Lembert sutures and by several ordinary sutures. This canal is a little over one inch long and is left exposed at the bottom of the wound; a number of sutures will then fix the stomach to the abdominal opening.

A few experiments upon dogs have suggested to me a plan which if not better, is at least equally as good as Witzel's method, and rests upon sound mechanical principles. The result upon the dog has been such as to meet every point which *a priori* it was intended to accomplish. The first steps of the procedure are the same as in Witzel's method. The

incision is made along the left border of the ribs about three inches long. The point for the introduction of the rubber tube is marked with the knife by a slight incision, but not through the walls of the stomach completely. A little over one inch from this point a circular purse-string suture is applied with a straight needle and strong silk, including only the serous and muscular coat of the stomach. After this the opening for the rubber tube, about the thickness of a No. 15 American scale catheter, is fully perforated into the stomach, and the tube fastened by a silk or catgut suture. The purse-string suture is now drawn together like a tobacco-pouch, and we have a double sphincter which will guard against any leakage from the stomach. With about six interrupted sutures I stitch the stomach to the parietal peritoneum. Both ends of the purse-string suture, which so far served us to hold and steady the stomach, are now armed with needles and passed through the entire thickness of the abdominal walls on both sides of the wound and then tied in a loop. It will anchor the stomach firmly in that position and can be pulled out in eight or ten days. The dog was fed immediately after the operation, and about the fifth day the tube in some way escaped into the stomach, but from the operation up to the end of two weeks, when the dog was killed, not one drop of fluid escaped through the fistula. The latter was found patent post-mortem, the whole stomach was removed and filled repeatedly with water, and as you may convince yourself to-day yet, it stands the test very well—not one drop of fluid escapes. In a case, operated upon by Mikulicz after Witzel's method, which died six months afterwards, the stomach, after it had been removed from the abdominal cavity and filled with water, did not stand the test so well, although fluid never escaped through the fistula as long as patient was living.

A hint thrown out by Ewald might be well worth considering. In cancerous stricture of the œsophagus he advises to make the fistulous opening in the vicinity of the pylorus so as to enable us to introduce the food directly into

the bowels by means of a rubber tube. His observations lead him to assume that in such cases the digestive power and motility of the stomach are almost totally abolished, and that it will only serve as an incubator for microbes, since his microscopical examinations of such contents of the stomach have revealed pure cultures of cocci, causing putrefaction. He further advises occasionally to wash out the stomach through the fistula with a solution of boracic acid, resorcin, and salicyl, etc., or to introduce these agents in substance. Brandy swallowed in teaspoonful doses, he thinks, will also act as a disinfectant.

THE RADICAL CURE OF HERNIA.

F. C. Larimore, M. D., Mt. Vernon.

At the annual meeting of this Society held in Sandusky, June 17th, 1891,* I read a paper on the "Radical Cure of Hernia" by the use of the "Buried Antiseptic Animal Suture," with a report of three cases. Two additional cases were reported at the annual meeting of the Society held in Cincinnati, May 6, 1892. †

In the continuation of this report, five more cases can now be added, making ten in all. This is a very small number, to be sure, but it represents such a variety and number of complications as to make them worthy of publication. These persons were entitled to as much knowledge and skill on the part of the surgeon as the hundreds unnamed who fell into the hands of the pioneers and leaders in this operation in the metropolitan centers of this country and Europe. It has been my earnest ambition to give them a modicum of surgical acumen, and the results which followed should be the measure of its success.

Case VI. *Strangulated Inguinal Hernia.*—Barber, John T., merchant, æt. 27, Democracy, Ohio. This man was operated on January 2, 1892, for right strangulated inguinal hernia, which was reported last year to the Ohio State Medical Society as Case V. At the time of this operation he had a hernia of left side. It should have been operated on then, making the operation one for double hernia; but the consent of the patient had not been requested, and his pulse

* Transactions of Ohio State Medical Society, 1891, p. 94.

† Transactions of Ohio State Medical Society, 1892, p. 297.

was greatly depressed by the anæsthetic (chloroform) employed in the taxis, so it was left undisturbed. As soon as Mr. Barber realized he would recover from the first operation, it was ever after a matter of regret to him that this hernia was not attended to. And strange to report, in less than one year this neglected hernia bobs up serenely in a strangulated form, demanding attention December 24, 1892. While lifting a box in his store, the hernia came down in left side. It kept down in spite of Mr. Barber's repeated attempts by hands and change of position to get it back. Late in the afternoon, Dr. E. L. Leonard was called but failed to effect reduction. I saw him later in the night in company with students Jno. Nichols and Rob't Tarr. There was no difficulty in obtaining consent for an operation, and the things demanded in the house were so favorably remembered that these were all arranged before the home nine miles distant had been reached. At 2 A. M., December 25th, after the customary preliminaries, taxis was employed, but failing, the operation was made. The sac contained a knuckle of small intestine, also a portion of greater omentum, both strangulated. After the division of the stricture, the intestine was returned into the abdominal cavity, the omentum sutured and resected, sac sutured and resected. It was now found that the testicle lay in the left inguinal canal, and that it had never descended into the scrotum. I tried to pocket it down in the scrotum, but the short and thickened spermatic cord frustrated these attempts. It was much in my way, and would have met the same fate of like organs in other cases, but for the circumstance that he had lost the right testicle in the former operation. Kangaroo tendons with Marcy's needle, the deeper, less deep, and superficial portions of the wound were closed. The testicle in the inguinal canal interfered with proper juxtaposition of the integument and delayed union after the operation. The pulse never exceeded 94, temperature 100°, respiration 22, and after 48 hours they were all within the normal limit, and remained so. Iodoform collodion dressing used. The

wound did not all unite by primary intention. Some of the tendons came out in twelve days. Relapse in less than one year.

CASE VII. *Strangulated Femoral Hernia.*—Tottman, Mrs. Rachel, æt. 68, Monroe Twp., Knox Co., O. Ruptured in right groin for twenty years. She wore a truss off and on, but of late years neglected to wear it. January 9, 1893, while getting out of bed, the hernia came down, and she could not get it back. Dr. J. W. Wagoner, of Gambier, O., was called, but failed to reduce it. I was called by telephone January 10, at 9 P. M., and learned the facts of the case. Fully appreciating the danger of delay in all such cases, but considering the poverty of conveniences for light, warmth, and so forth, in the patient's country home, I fixed the hour for consultation at daylight the next morning. The engagement was promptly kept. Mercury 12° below zero. At this time, January 11, 5 A.M., the hernia had been strangulated forty-eight hours. Tongue red and dry. Pulse 108 and feeble. Occasional vomiting. Skin covering tumor inflamed, so much so that no effort was made to reduce the hernia. Assisted by Dr. Wagoner and student Jno. H. Nichols, we cut down and found the contents of the sac to be omentum and intestine. The stricture was relieved, and both replaced in the abdomen. Sac sutured and resected, and wound closed and dressed strictly in accordance with Dr. Marcy's suggestions. From this time on the patient was not sick. Mrs. Tottman was very energetic, and as a matter of precaution she was kept in bed for ten days. Convalescence was prolonged five months by a stitch abscess, small and superficial. This healed in a few weeks by packing with iodoform gauze, incision and sublimate dressings. Union of deeper strictures firm and complete. Radical cure complete. Died December 6, 1893, of enteritis.

CASE VIII. *Strangulated Femoral Hernia.*—Young, Jacob, æt. 61, farmer, Mt. Vernon, O. Ruptured in right groin for several years. Did not know its nature. At times he would have trouble with it, but generally succeeded in relieving

himself. April 13, 1893, while mowing hay, it came down, and his efforts for relief failed. Dr. L. L. Williams was called. Nausea and vomiting were so persistent that his diagnosis was somewhat undecided as to whether the stomach trouble was primary or due to strangulation of hernia. I was called on the morning of the 15th. Found the patient in a state of partial collapse. Vomited in my presence, which was prolonged with violent retching and ejection of biliary matter. He had a small tumor in right femoral region which was very painful. Mr. Young is the father-in-law of Mr. Barber, the latter having had two operations for hernia in 1892. After my diagnosis of hernia was stated to him, he said: "Dr., I would rather be cut than have it put back by handling." Accepting this unexpected but judicious advice of the patient, we at once proceeded to the operation. I was ably assisted by Dr. J. E. Russell, Dr. L. L. Williams, and students Jno. H. Nichols and W. R. Eastman. Mr. Young was thin in flesh; indeed everything was more favorable for operation than any former case. Under the influence of ether, the hernia was easily and *apparently* completely reduced; notwithstanding, it was decided to go on with the operation. The sac was laid open and found to contain omentum, and adhesion to its inner surface to such an extent as to preclude reduction. The intestine no doubt was out, but had been reduced by the taxis. The omentum was dissected up and tied off. The operation was now completed in the usual manner, and was the most complete and perfect in all its details which I have made. Recovery was rapid and complete. The patient was hardly indisposed after the operation. In less than two weeks he was out of bed, and in less than thirty days he was riding in his sulky training horses. Complete cure.

Case IX. *Strangulated Umbilical Hernia.* — August 13, 1893. Dudgeon, Mrs. John, Harrison Twp., age 60. Has had an umbilical hernia for twenty-five years. It has been a source of much trouble and frequently strangulated.

I was called to see her on August 13th, with Dr. Coleman, of Howard, and Dr. Hyatt, of Gambier. Mrs. Dudgeon is five feet high, and weighs 250 pounds. The hernia was strangulated, and had been so for twenty-four hours past. The tumor was about the size of an orange, coverings very thin and somewhat inflamed, in folds of skin surrounding. Operation: Found the skin very closely united to the sac, wall of the sac very thin, contents knuckle of intestine and a portion of the omentum. Could not reduce either until the ring was cut. The border of the ring was very thick and cartilaginous. Dissected the sac down to the border of the ring, sutured it with kangaroo tendon, and left the stump in the ring. With tendon sutured the deeper structures of the abdominal wound over stump of sac. The rest of the wound sutured in the usual way. Iodoform collodion dressing and a body bandage. Recovery complete.

CASE X. *Strangulated Inguinal Hernia.* — March 27, 1894. Elliott, Wm., age 23. Two years ago he came to my office, and I fitted him with an elastic truss. This spring the rubber band gave out, and he has been careless, and several times the hernia came down. On March 3d, Dr. E. L. Leonard, of Democracy, O., had much difficulty in reducing it, but finally succeeded. March 27th, while on his way to Danville, his hernia came down. He was taken into the house of his brother-in-law near by, and Dr. Leonard summoned. I was called at 3 P. M. with Dr. P. Pickard, of Mt. Vernon, O. The hernial tumor was very hard and painful, patient restless and tossing about. The tumor was situated under Poupart's ligament, and appeared to be of the femoral variety. *Elliott wanted it reduced and not cut.* I assured him that against my judgment, I would try and reduce it. Eight hours had now elapsed since it became strangulated. Taxis under ether was attempted for twenty or thirty minutes without success. I then cut down on the hernia, and found in the sac a knuckle of the ilium eight inches long, dark color and very much congested; also a

Table I.—VARIETIES AND RESULTS OF TEN OPERATIONS FOR RADICAL CURE OF HERNIA.

Case.	Name.	Age.	Variety.	When Made.	Time Elapsed.	Results.
I	Bell Robinson	58 yrs	Right inguinal. Strangulated 5 days.	May 4, 1890	4 years.	Complete cure.
II	Keenan, Patrick	42 "	Right inguinal. Irreducible.	Sept. 15, 1890.	4 years.	Failure, but improved. Can wear truss.
III	Van Winkle, Alexander	64 "	Left inguinal. Strangulated.	Oct. 29, 1890.	4 years.	Complete cure.
IV	Ewers, Thos. S	65 "	Right inguinal. Strangulated 3 days.	Nov. 26, 1891.	32 months.	Relapsed in one year.
V	Barber, John T	27 "	Left inguinal. Strangulated.	Jan. 12, 1892.	2½ years.	Cured.
VI	Barber, John T	28 "	Left inguinal. Strangulated. Undescended testis.	Dec. 25, 1892.	1½ years.	Relapsed in one year.
VII	Tottman, Mrs. Rachel	68 "	Right femoral. Strangulated.	Jan. 11, 1893.	11 months.	Complete cure. Died Dec. 6, 1893, of enteritis.
VIII	Young, Jacob	61 "	Right femoral. Strangulated.	April 15, 1893.	1 year.	Complete cure.
IX	Dudgeon, Mrs. John	60 "	Umbilical. Strangulated.	August 13, 1893.	9 months.	Complete cure.
X	Elliott, Willie	23 "	Right inguinal. Strangulated, undescended testis.	March 27, 1894.		Died on 15th day of gangrene of intestines.

REVIEW.

This makes a series of ten cases of hernia operated for radical cure. Nine were strangulated, and one irreducible. Two were complicated with an undescended testis. In variety, seven were inguinal, two femoral, and one umbilical. The average age, 49.6 years, six being above 60 years of age. One death only from gangrene of intestine. Six resulted in complete cure, 10 mos., 11 mos., 1 yr., 2½ yrs., two 4 years. Two relapsed, both in one year. One a failure from the start. In the case of failure, and the two relapsed cases, the hernia is only a small protrusion at the site of the internal abdominal ring, and a truss can be worn with the greatest ease. It must be noted that all these operations were performed under the most unfavorable circumstances, and should not be compared with operations performed for the radical cure in non-strangulated cases. With but one exception, perhaps, Case X, the results are so satisfactory as to justify combining the operation for the radical cure with that for the relief of the strangulation in nearly all cases. So far as I can learn, these ten cases represent all the strangulated hernia which came to an operation in Knox County in the past five years, there being two notable exceptions: One of a man who was proffered an operation, but refused, and as a result of his folly died; the other that of a woman who had a strangulated hernia—operation, death resulting in fourteen hours. If this can be taken as a fair average, namely, two cases of strangulated hernia for each county a year, there would be in the State of Ohio 176 cases annually. Furthermore, if one person in every 20 of the population is ruptured, there would be in Knox County 1500 hernias, and in the State 132,000. The usefulness of this large army is seriously impaired. A sword of a Damocles hangs over each head, for a strangulation may occur at any time, fraught with the greatest danger and the most serious results. The field is a large one. Ignorance and superstition are giving way to enlightened and advanced views as to the

curability of hernia. A brighter day is dawning and ere long not a single case of hernia will be relegated to the great army of truss-bearing victims. During the decade just closing, the operation for the radical cure of hernia has been performed a sufficient number of times, and the results so satisfactory as regards safety and relapses, as to make it not only a justifiable but an imperative operation, justifiable in any case, and imperative in complicated and irreducible hernias. Of several methods advocated for the radical cure of hernia a careful study of the statistics will demonstrate the best one to be that of Bassini, or some slight modification of the same. For myself, I am firm in the conviction that all in all, Dr. Henry O. Marcy, of Boston, has given the best and most complete technique for this operation of any one. Indeed, it ought to be known as the American Operation for the Cure of Hernia, and entitled "Marcy's Operation." Dr. Marcy antedates Bassini several years, in the importance of restoring the inguinal canal, and stands undisputed as the first advocate of the buried kangaroo tendon, thus originating and establishing two of the most important factors in the success of the operation.

In addition to this, Dr. Marcy has given to the profession the best and most complete work, in any language, on the subject of hernia: "The Anatomy and Surgical Treatment of Hernia," by Henry O. Marcy, 1892. This valuable work contains a table of over 3,000 cases, non-strangulated, operated upon for radical cure, showing less than 1 per cent. of mortality, and less than 10 per cent. of relapses.

Abstract of Dr. Marcy's paper read at the American Medical Association meeting, held in San Francisco, June 6-9, 1894, on the "Cure of Hernia":

After showing that there was a general widespread conviction that hernia was amenable to cure, and that the surgical procedures recommended for the same were advocated for general acceptation, Dr. Marcy proceeded to point out the differences of method which pertain to the more generally accepted technique. He demonstrated that in old hernia of

considerable size, it was essential to isolate and remove the peritoneal pouch to its very base. Dr. Marcy thinks it of some importance to close the base of the sac in an even suture of several stitches, rather than by ligature, in order to avoid, as far as possible, a depression or puckering of the peritoneum. This having been effected, the cord is carried inward and upward so as to close in and reinforce the weakened internal ring. The relaxed weakened structures which enter into the composition of the posterior wall of the inguinal canal are intra-folded by a deep double continuous tendon suture, which is continued upward until the posterior ring is firmly closed about the cord. In this manner the peritoneum, which is usually more or less changed, lining the deformed shortened canal, is obliterated. If the abdominal wall has been greatly thinned from the long wearing of a truss, it is often wise to reinforce the posterior border of the canal by suturing the edge of Poupart's ligament and the conjoined tendon in the manner described, and thus greatly reinforce the posterior portion of the canal. The cord is now replaced, and the abdominal wall closed from above downward with a double tendon suture. In the event of having united the tendinous structures beneath the cord for the sake of reinforcement of the weakened posterior structures, the relaxed abdominal muscle is folded over to cover in the cord, making a new external border of the inguinal canal. The wound is closed with buried sutures and sealed with collodion.

While Dr. Marcy emphasizes the technique as above outlined, he recognizes that the result may be obtained by the application of sutures in a variety of ways. He distinctly points out that the important factor of success, without which failure is likely to occur, is the reconstruction of the internal ring, and the restoration of the obliquity of the reinforced inguinal canal. The essential factorage in securing this, is the buried suture. The material used may be in considerable variety, but for many reasons it has been demonstrated that the tendon suture is greatly to be preferred. The wound

must be made and maintained aseptic, and closed without drainage. When this is accomplished, primary union is almost the invariable result.

Dr. Marcy shows clearly that the operation usually accredited to Bassini in all its essential features had been published over and over by him long before Bassini wrote upon hernia, and that the buried animal suture was adopted by him for the very purpose of reinforcing and reconstructing the inguinal canal, and was published in the *Medical Journal* as early as 1870.

Dr. Marcy justly claims that the honor of demonstrating a safe and permanent means for the cure of hernia should be accredited to American surgery.

Table II.—NUMBER, RESULT AND METHODS OF OPERATIONS FOR RADICAL CURE OF HERNIA.—IN EUROPE.

Name, Reference.	No. of Cases.	Mortality.	Relapses.	Sac.	Pillars of Ring.	Integument.
Banks, Mitchell, *British Med. Jour.*, Dec., 1887	106	4 died.	18	Resected.	Silver suture.	
Barker, ———, *British Med. Jour.*, 1890	50	None.	8	Resected. Catgut.	Silk or catgut.	Silk.
Ball, ———, *British Med. Jour.*, Dec. 10, 1887	22	None.	3	Torsion. Catgut.	Silk.	Silk.
Socin, Basle	75	2 died.	----	Resected.	Closed.	
Czerny, Heidelberg, Berlin, *Klinische Wochenschrift*, 1891	19	None.	----	Resected. Silk.	Closed. Silk.	Silver wire and catgut.
Championerre, ———, Radicaldes hernies, Paris, 1892	275	2 died.	14	Resected.	Closed.	Catgut.
Schedes Clinic, Vol. 19, St. Thomas Hospital Reports, Vol. 19	165	2 died.	----	Resected.	Closed.	Suture not known.
Bassini, ———	262	1 died.	7	Resected.	Closed. Restores inguinal canal.	Drainage.
Macewen, ———, *Brit. Med. Jour.*, Nov. 10, 1888	81	None. 11 died.	1 51	Tucks up Sac.	Closed.	Catgut.
Total	1055	1 per cent.	5 per cent.			

Table II.—NUMBER, RESULTS AND METHODS OF OPERATIONS FOR THE RADICAL CURE OF HERNIA.—IN AMERICA.

Name, Reference.	No. of cases.	Mortality.	Relapses.	Sac.	Pillars of Ring.	Integument.
Marcy, H. O., *A. M A. Jour.*, Aug. 19, 1893---	133	None.	6	Resected. Continuous double suture, kangaroo tendon.	Obliquity. Inguinal canal restored. Two rows continuous double suture, kangaroo tendons.	Buried kangaroo tendon.
Halstead, ———, *Annals of Surgery*, May, 1893----------	84	None.	8	Resected silk.	New canal, new ring, resects veins in cord.	Buried silk.
Coley, ———, New York Private Letter, April 18, 1894----------	120	1, of double pneumonia.	1	Resected kangaroo tendon.	Bassini's in 92 cases kangaroo tendon.	Catgut.
Bull, W. T., *Med. News*, 1890, p. 8----------	72	3	44	Resected.	Svein's, Czerny's and Barker's.	
Park Roswell, *Anat. and Surg. Treat. of Hernia.* Marcy, 1892----------	115	None.		Resected.	Closed. Silkworm gut.	Buried catgut.
MacBurney, ———, *N. Y. Med. Jour*, Jan., 1888----------	27	None.		Resected.	Open method.	
Total----------	551	4	59			
		.72 per cent.	10 percent.			
Grand Total--------	1584	.86 per cent.	7½ percent.			

This table includes cases of non-strangulated hernia only, and a little more than one-half of the cases on record. It shows a mortality of .86 per cent. and 7½ per cent. of failures or relapses. The percentage of relapses agrees very closely with a collection of 1,769 cases by Sir Wm. McCormack, showing 7.15 per cent. of relapses, *vide* Bradshaw Lecture, *Lancet*, December, 1893. Many will doubt the correctness of these statistics, but it must be admitted by all that they come from the highest sources, and are subject only to the usual errors and difficulties attending the following up of such cases. As the fatal cases usually die in a few days, the mortality record is more reliable than that of relapses. The operation, then, is both safe and sure. All the operators named conform with the strictest rules of aseptic surgery, obtaining primary union in 95 per cent. of the cases operated upon. In the language of Dr. Marcy, "Making a wound in *aseptic* tissues, *aseptically* made and maintained." Dissection is made from without inwards, little regard being had for the different layers covering the hernia. The sac opened, contents carefully examined, and if in proper condition, returned to the abdominal cavity. Omentum can be resected to almost any extent with perfect impunity. The sac dissected up from surrounding structures, and sutured across its neck and resected, leaving the parietal peritoneum without a dimple in it. On all the foregoing points there is a consensus of opinion among operators. As to the closure of the wound, deep and superficial, and the kind of suture material, there is a divergence. Kangaroo tendon, catgut and silk all have their advocates. Drainage is not used, primary union being desired by all.

I have not alluded to the management of the intestine in case of gangrene. My last case was unfortunately one of this nature, and my attention was called to it in such a way as to reveal how helpless I was to meet it. If it be in order at the next annual meeting, I will take up this subject again, and consider the measures as how best to meet this most dreaded and fatal termination of strangulated hernia.

CONCLUSIONS.

1. The operation for the radical cure of hernia is a safe operation. Mortality, .86 per cent.

2. The operation results in a permanent cure, relapses occurring in but 7½ per cent. of the cases.

3. The operation should be made with the strictest aseptic technique.

4. Make a free incision over and with the long axis of the tumor from without inwards.

5. Open the sac and examine the contents deliberately and carefully, generally resecting the omentum.

6. Dissect up the sac, ligate its neck high up with a chain suture, and resect it below the sutures.

7. Restore the obliquity of the inguinal canal by two rows of deep sutures — continuous double.

8. Close the integument with a buried suture.

9. For all sutures use kangaroo tendon, and do not draw so tight as to constrict the tissues.

10. Final dressing — iodoform collodion.

11. Keep patient in bed from three to seven days.

12. Do not put on a truss.

DISCUSSION.

DR. F. F. LAWRENCE:

The term "radical operation" is one which has always seemed to me a reproach to surgery. The idea that an operation should be done or advised which is not radical, would seem to imply experiment. It is to be hoped that in the near future the term radical will be omitted, for the same reason that we do not apply it in ovariotomy, trephining or amputation.

The object sought in all operations for hernia is to close the hernial opening in such a manner as to make a permanent closure. The various methods of doing this are all more or less uncertain, but no more so than are the results in any other capital operation, and only show us that however perfect our method may seem, there are features in each case to which the method must be adapted, else failure

will probably be ours. And yet there are a few points common to all operations, the neglect of which will thwart us.

1st. The hernia must not only be returned within the abdominal cavity but must be absolutely free from all attachments to the hernial sac.

2d. Adhesions between contiguous portions of intestine, especially if near the "angle of flexion," must also be broken up, and the "angle of flexion" reduced (or straightened).

3d. The sac must be liberated from its attachment to rings, drawn down, cut off and so stitched as to leave no fold of peritoneum within inguinal canal or rings.

4th. The edges of rings, or the pillars, should be scarified and brought into direct apposition, to secure as little cicatricial tissue as possible with the most direct adhesion of the structures concerned.

5th. All of the various methods are more or less derived from or modifications of Wood's method.

Strangulation is more likely to occur in a small hernia than in a large one, and for the reason that the "angle of flexion" is shorter, and that this is more frequently the cause of strangulation primarily than stricture at neck of sac.

The doctor spoke about the treatment of gangrenous intestine by colotomy. It would seem that resection and anastomosis, either by suture or Murphy's buttons, would be preferable to colotomy. The anastomosis can be made with Murphy's buttons in much less time than a colotomy, and leaves the patient in just as good or better condition so far as the present is concerned, and without the necessity of a second grave operation.

The question as to what suture we shall use seems to me to be of little moment, provided we use an aseptic suture and one that is not too readily absorbed and that is non-irritating.

That all cases of hernia demand an operation is a rule that should have few exceptions, viz., in the aged where hernia is large, in those debilitated by other disease, in the scrofulous, where we would probably not get good union and the result would probably be a failure. The success of the operation will be in proportion to the length of time the hernia has been in existence, the more recent herniæ offering the best prospects and *vice versa*.

I know that perhaps some may question this statement. To such I would say, wait, and time will show which is right.

RHACHIOTOMY FOR SPINAL INJURY.

WITH REPORT OF A CASE.

J. C. Oliver, M. D., Cincinnati.

The number of cases of this sort in which operative interference has been practiced is so small that it seems the duty of each operator to put on record the report of all cases occurring in his practice. Each additional case must prove of value in determining the proper procedure to be adopted in cases in which there are symptoms referable to injury of the spinal cord.

The report here presented, while it does not contain anything new or extraordinary, serves to emphasize facts reported by other observers.

Chas. M., æt. 34, American, farmer, was first seen by me September 19, 1893. Fourteen months ago the patient fell from a tree, a distance of about twenty feet. He struck between his shoulders, head foremost; the body then twisted violently toward the right side. The patient was, so to speak, jack-knifed.

Consciousness was not lost, but an immediate paraplegia supervened. Within two days a bed-sore appeared over the sacrum, which persisted for eight months. The paralysis involved both the bladder and rectum; the urine dribbling away constantly.

The pain and soreness from the immediate injury gradually passed away, leaving behind the paraplegia, incontinence of urine and rectal incapacity.

At the time of my first examination the conditions above mentioned were found. There was total and absolute loss of sensation and motion of the lower extremities, a constant dribbling of urine and rectal apathy. A projection over the region of the 8th and 9th dorsal vertebræ was readily apparent. The reflexes were all present and exaggerated. The legs were not atrophied or contractured. No reaction to either faradic or galvanic current.

The general condition was excellent, he being well nourished and of good color. He was able by means of a bar to raise himself from his bed into a rolling-chair, and then to propel himself with ease. The girdle sensation was not well defined, although there was a suggestion of one present.

After consultation with Drs. Comegys, Conner, Dandridge and Freeman, the patient was advised to have the parts thoroughly explored in order to ascertain the pathological condition present; at the same time he was informed that the strong probabilities were against his receiving any benefit from the operation.

The patient readily consented to the proposed operation, so on September 28th, with the assistance of Drs. Freeman, Mussey, MacMillan and Gormuly, and in the presence of Drs. Comegys, E. W. Mitchell, B. Stanton, F. W. Langdon, Geo. E. Jones, N. P. Dandridge, P. S. Conner and others, the operation was made at Christ Hospital. After cutting through the skin and clearing the muscles from off the laminæ the spinous processes were bitten off; a chisel was then used to effect an entrance into the spinal canal; this having been accomplished the arches were bitten away with a *rongeur* forceps. The arches of the 7th, 8th and 9th dorsal vertebræ were removed, and it was found that the 7th had been dislocated, being turned to the right, the 8th and 9th had probably been fractured, and the spinal cord had been caught between the dislocated 7th and the fractured 8th, thus producing an apparent disorganization of the cord for the space of about one-half inch. The dura mater was everywhere adherent to the bony canal; after

these adhesions were separated the dura was opened, and the cord found to be in apparently good condition above and below the pinched portion, but the structures of the cord seemed to be entirely absent from the pinched portion described above. The portion under observeration did not pulsate either before or after the operation. But a very small amount of fluid escaped when the dura was opened. The edges of the dura were not stitched together, but the muscles were sutured and then a separate (continuous) suture was used to draw the edges of the skin together. The usual dressings (dry) were then applied and the patient returned to bed.

During the remainder of this day and most of the next the patient vomited excessively, apparently the effect of the ether. After this passed off there was no unpleasant symptom.

The next day (Sept. 29th) he complained of a drawing or constricting sensation in the hips. The urine was withdrawn by catheter every four hours.

October 6th. Stitches removed, union perfect.

October 16th. At this date the patient's condition is very similar to that before the operation, except that he retains his urine for four hours without any passing away in the meantime, and the bowels move more easily than previously. He is now taking strychnia, 1-30 gr., three times daily, and is having daily massage for the legs and abdomen.

On November 3d he returned to his home. The paraplegia remained unchanged, the urine had become uncertain, sometimes being retained for four or five hours and then again leakage would occur within a short time after the catheter was used. The bowels, he declares, move more easily and satisfactorily than at any time since the accident.

After this recital of the case it seems scarcely necessary for me to call your attention to the fact that the operation in this case was not productive of a cure, but I do wish to call your attention to the fact that a real benefit did occur

in the urinary and rectal symptoms. This same fact has been noted by other observers, and as these are the symptoms which are most annoying to the patient it seems to me that this improvement alone would suffice to recommend the operation.

I shall not inflict upon you a critical review of all the cases published under this head, but there are some points of exceedingly great interest which can only be brought out by comparison with other reported cases.

The question of the propriety of surgical intervention in these (traumatic) cases is not at all a decided point. A second question, and to my mind an exceedingly important one, is *when* to operate after injury to the spinal column producing paraplegia.

In regard to the wisdom of operating in these cases there can be but one logical conclusion, *i. e.*, when other means have failed and the patient's general condition is such as to give one a reasonable assurance that the operation of itself will not prove fatal, we should feel justified in resorting to active surgical intervention. From the literature at my command, and I have gone over this pretty thoroughly, one cannot expect to accomplish much by operation, yet from the fact that some few cases have been benefited and because we cannot definitely tell the exact condition present in a given case, one should certainly make the exploratory operation and thus be convinced of the necessity or futility of further procedure.

In what cases should the operation be made? When paraplegia is an immediate consequence of the injury it is probable that the damage done to the nervous elements of the spinal cord is so great as to produce disorganization of that structure, and hence no operative measures will be successful in restoring lost function. It is true that the paralysis may be the result of pressure from a displaced fragment of bone, possibly a small piece driven into the substance of the organ, but the strong probability is that we have to deal with a badly bruised or disorganized cord; for the former condition rest

and extension, or fixation, will accomplish all that rhachiotomy can; for the latter nothing can be done.

Our colleague, Dr. Ryan, has reported an exceedingly interesting and suggestive case illustrating the truth of the remarks relative to the method of treatment by rest, or at least by non-interference. This case is reported in the *Lancet-Clinic* for May 23, 1892, and briefly is as follows: A man fell from a telegraph pole and sustained a fracture of the dorso-lumbar spine. He had complete paraplegia with the exception of some control over the extensors of the right toes. Retention of urine, constipation and atrophied limbs completed the clinical picture when he was brought to the hospital thirty-six days after the accident. He was treated with potassium iodide in large doses, the Paquelin cautery and extension in a plaster jacket. Recovery was complete.

Several important points are not stated in the report of this case, and the omission is undoubtedly due to the fact that the patient was not brought under Dr. Ryan's observation until 36 days after the receipt of the injury. The time of the supervention of the paraplegia is an important item bearing upon the nature of the spinal lesion. The result of the treatment in this case leads one to the conclusion that there was no organic lesion of the cord; the cause of the paraplegia was probably compression exercised by a blood-clot, which was subsequently absorbed.

An extensive quotation of cases is hardly necessary for the purposes of this paper, but a few in which operative measures gave relief would be appropriate in order to establish the line between operable and inoperable cases.

Rieder (Muenchener Medicinische Wochenschrift, Oct. 6, 1891) reports the case of a man who fell from a second story. Somnolence, paraplegia and anæsthesia of the lower limbs were present. The spines of the fifth and sixth dorsal vertebræ were prominent. Sixteen hours after the accident resection of the spines and laminæ was performed and the pressure upon the cord was relieved. Even at this early

period the cord was somewhat softened. Six months afterwards the patient had a slow, spastic gait, although the other symptoms were absent.

Weiss (Nancy Revue Medicale, Aug. 1, 1891) operated upon a man of 34, who had a dorso-lumbar kyphosis, the result of a fall; associated with this was paraplegia, paralysis of rectum and bladder. A month after the accident the arches were removed; the cord was bent; the dura was not distended and was left unopened. Immediate and permanent relief was experienced; the man returned to perfect health.

The quoted cases along with the one reported this evening will, I think, suffice to call attention to the fact that the main importance of spinal fracture is, like fracture of the skull, the injury done to the nervous structures enclosed. Mere fracture of the spine is, of itself, no more important than fractures elsewhere. Injury to the spinal cord, providing there be more or less disorganization of this structure, is irreparable. August Wiessmann says that "nervous tissue once destroyed is never replaced," and the experience of physicians gives strong confirmation to this statement.

From these statements it is easy for us to arrive at the conclusion that surgical intervention in this class of cases can only be of avail when the spinal cord is structurally intact. The only difficulty in the way of giving us an absolute rule in these cases lies in the fact that our powers of diagnosis are not complete and perfect enough to positively state whether the cord is intact or not. Were it possible so to determine, a considerable amount of useless surgery might be avoided. As it is, we ought in every case, after the possibility of spontaneous restoration has vanished, to give the patient the benefit of the doubt and accurately determine the condition of the cord.

Leaving out of consideration the above-mentioned class, we still have a considerable proportion of cases in which compression is the condition present. This pressure may be

caused in a variety of ways: it may be due to hemorrhage, it may be bony, or it may be due to adhesions.

Theoretically it seems easy to diagnosticate hemorrhage; here we should have a gradually developing paralysis—it should not occur instantaneously; but an element of confusion arises from the fact that the patient may be so stunned by the fall as to be unable to say just when the paraplegia developed.

It seems to me to be impossible with our present knowledge to discriminate between bony compression and organic lesion of the cord. Undoubtedly the vast majority of actual nerve-lesions are the result of injury inflicted by the bony structures, yet it is undoubtedly possible (and recorded cases prove their existence) to conceive of an injury sufficient to cause loss of function and not sufficient to interfere with the integrity of the cord.

For these compression cases rhachiotomy should furnish relief, provided the compression has not been maintained so long as to cause actual degeneration of the cord. You will recollect that in the case reported by Rieder softening had occurred at the end of sixteen hours, and from the report we are lead to infer that the spastic gait from which the patient subsequently suffered was the result of this softening.

Having, theoretically at least, divided these cases into the classes of operable and inoperable, the next and most important question is as to the time for operation. Should these operations be done as soon after the injury as possible, or are the best interests of the patients served by postponing operation until nature has been given a chance to repair the damage?

Rieder's case would seem to prove that an acute, irreparable softening of the cord may take place within a few hours after the infliction of the trauma, while that of Weiss clearly proves that the cord may completely regain its functions, even though subjected to pressure for a considerable period of time (one month). It is clearly evident that the variety and nature of the pressure is important — a pres-

sure which interferes with the nutrition of the cord sufficiently to cut off the blood supply to a portion should be relieved at the earliest possible moment, lest the secondary condition be far more serious than the primary. Late removal of such pressure would be useless.

Compression from blood-clots might be avoided by an early operation, or at least such compression could be much more quickly removed by the surgeon than when the process is left to nature. It seems to me that early operation is advisable in cases where there is the history of a slowly developing and gradually increasing paralysis. By means of an early operation all hemorrhage may be checked and the danger of compression from this source be reduced to a minimum.

A third advantage in immediate interference lies in the positive knowledge that would be obtained as to the exact condition present, and the prognosis could be much more intelligent. This point in certain cases is one of the very greatest importance to the patient and his family.

Prolonged compression could be obviated in every case by prompt operation and the danger from this source be avoided. Reported cases up to the present time are not very numerous, but those I have examined are not at all encouraging where the operation is undertaken at a late date.

On the other hand there are several valid objections which can be urged against early operation. In the first place a large percentage (just how large I am unable to ascertain) of these cases die within the first few days following the injury, and were these cases operated upon the mortality following surgical interference would be very great, and the operation would have to bear the responsibility.

A second objection is the presence of shock, and shock is generally pretty pronounced in these cases. The additional shock of the operation might throw the balance against some patients who might otherwise survive the primary effects of the trauma. It seems to me that this same argument might be applied with equal force to any traumatism

in which shock is a feature. This condition should be viewed in the same light in relation to rhachiotomy as it is in regard to other traumatism.

A danger in early operations which would have had much more influence a few years since that it should have at the present time is the danger of sepsis arising from the mushy condition of the parts, and also because of the anatomical arrangement of the structures invaded. This is a danger not to be treated lightly, but I feel that proper aseptic precautions will here, as elsewhere, prevent the introduction of septic matter; hence this danger, of itself, should not be regarded as any contraindication to the early operation.

The inability to clearly distinguish structures at an early period because of the condition of the parts, is a more serious objection — the muscles and tissues generally will be found infiltrated with blood and more or less confusion from this source necessarily arises, but it seems to me that the difficulties would not be insuperable; care and patience would be required, but these every surgeon gives freely in every case.

It is perfectly legitimate to compare fractures of the spine with fractures of the skull; the conditions are very similar and the dangers very nearly the same. In each case the gravity of the case depends upon the injury to the contained organs, the fracture itself being of but little moment. What one of us would think of waiting to see whether a paralysis caused by a depressed fracture of the skull would disappear without surgical aid? What would be worse surgery than to allow the delicate nervous structure to be irritated and perhaps ruined by a pressure we could remove? And yet if my comparison is a legitimate one, and I think it is, the same reasoning should apply to the spinal cord as is applied to the brain. It should be our aim and object to remove pressure from the spinal cord just as soon as possible after the infliction of the injury. Moullin advises early operation in those cases in which the spine is fractured by direct violence, and reserves

late operation for those in which indirect force produced the result. I can see good reasons for this course because, as a general thing, indirect violence of sufficient force to cause fracture of the spine and paraplegia will have produced the paralysis through an irreparable injury to the cord. The case reported to-day proves this.

One point to be borne in mind, especially in those cases in which an early operation is contemplated, is the likelihood of other serious injuries than that to the spine being present. Of course error upon this point should be carefully guarded against by a careful examination of the body.

Phelps (*N. Y. Medical Record*, Jan. 20, 1894, p. 94) says: "Recent fractures and dislocations of the spine should be operated. The large mortality should not deter, since cases that would surely die or recover hopelessly paralyzed may be saved."

From the literature upon this subject one readily comes to the conclusion that here, as elsewhere, circumstances alter cases, and that much care and nicety of discrimination is necessary before one can distinguish the operable from the inoperable cases. The nature, kind and manner of injury seem to be the deciding points for and against operation.

SOME REMARKS ON TOTAL EXTIRPATION OF THE FIBROID UTERUS.

WITH ILLUSTRATIVE CASES.

RUFUS B. HALL, M. D., CINCINNATI.

The subject of fibroid tumor of the uterus is too broad to be considered in all its aspects, in the time allotted, before this Society. I have therefore thought it advisable to speak of but two phases of the subject: first, cases requiring operation; second, methods of operating.

Clinical experience demonstrates that only a small percentage of those suffering from fibroids require operative interference for relief. This is so well known that the profession at large have come to regard them as purely innocent growths. This is true in the majority of cases. My experience, based upon more than two hundred carefully recorded cases justifies me in saying that the majority of women from thirty-six to forty-five years of age, suffering from fibroid tumors, do not require operative interference, but this fact increases our responsibility in determining early the cases really requiring operation.

A great many women who are the subjects of fibroid tumor suffer no more inconvenience than a slight pain preceding and during the menstrual period, which is not excessive or unduly prolonged. They suffer but little, if any, from pressure symptoms or peritonitis, and the tumor only annoys them because they are conscious of its presence by

manual manipulation or from information given them by their physician. As long as the patient remains comfortable and her general health is not interfered with by pressure or loss of blood, she certainly ought not to be subjected to an operation.

The chief symptoms and secondary diseases of cases requiring operative interference, are hemorrhage, pain, cystitis, peritonitis and pressure causing temporary intestinal obstruction. These cases when they do not yield readily to internal medication combined with thorough curetting, the patient being put under good hygienic surroundings, are to be looked upon with suspicion and the future progress of the case watched with unusual care and interest. Experience leads me to believe it is out of this latter number, where the symptoms cannot be easily controlled, that almost all of the operative cases come. I do not mean by this statement that all of these cases should be at once subjected to the radical operation of hysterectomy, but I wish to emphasize the opinion that these cases should be carefully watched. It is not unusual to have a case referred for operation where there has been severe and frequent hemorrhage with metrorrhagia lasting from ten to fifteen days each month for a number of years. To say that these patients are in the most unpromising condition for such a radical operation is to repeat what you all know. They are exsanguinated to an extreme degree.

Three cases operated upon by me within the past year, although still able to walk, had lost such large quantities of blood that the act of rising to the feet caused severe vertigo.

They suffered but little pain at any time but had been confirmed invalids for years. They had had all kinds of internal medication, combined with electricity, before they were referred to me, with the result of only lessening the hemorrhage, not controlling it. These cases illustrate in a forcible manner the point I wish to emphasize; that is, if hemorrhage and metrorrhagia cannot be controlled within a few months by careful medication, that case should be re-

ferred for operation and not be permitted to become so enfeebled as to make the result of the operation problematical. In other words, if once a patient becomes a bleeder she nearly always continues to be a bleeder, and there is no permanent relief except by operation.

There is another class of cases in which the most prominent symptom is not hemorrhage, but pain from pressure of the tumor. A tumor the size of a cocoanut, which has become adherent in the pelvis from inflammatory exudation may cause intense suffering and a great number of reflex symptoms which demand relief. In support of this I could cite many instances, of which the following is a fair illustration :

Miss M., age forty, referred by Dr. Rhu of Marion, Ohio, was known to have had a fibroid tumor for more than three years. For one year before my visit she observed that she was growing more and more incapacitated for walking. When she attempted to walk she suffered from a sense of fulness in the pelvis and pain in the legs and head. Much of the time she was practically disabled so far as locomotion was concerned. She could not walk across the street without causing pain in the legs, which was at once reflected to the head, so that she suffered greater pain in the head than in any other part of the body.

I saw the case in consultation with her physician, March 12, 1893, at which time she was just recovering from a sharp attack of peritonitis. On examination I found the tumor occupying the entire space in the pelvis, wedged down, firmly fixed by adhesions and causing great pressure, with a large nodule above and to the left side. It was evident the patient could only be relieved by the removal of the tumor. As her life was in danger from recurring attacks of peritonitis, I advised immediate removal. Total extirpation was made at my private hospital, March 16, 1893. The entire lower part of the tumor was adherent. After removal the tumor somewhat resembled in shape two large cocoanuts joined together. The patient made a prompt and uninter-

rupted recovery and is now enjoying excellent health. By examination of the tumor we found a good explanation of the cause of the pain complained of when the patient attempted to walk. The tumor filled the pelvis, where it had become firmly adherent to its walls, the resulting pressure on the nerves of the sacral plexus causing the pain in the legs and inability to walk. The pain in the head was a reflex from the same cause. As the tumor continued to enlarge, it could do so in only one direction, upwards. The weight from above when the patient attempted to walk was an additional source of pressure on the nerves, which was somewhat relieved when the patient lay down. It is hardly necessary to add that this patient had been under constant medical treatment, including electricity, for years before the operation.

That we may have cystitis from the pressure of a fibroid tumor alone, is well illustrated by the following case: Mrs. K., Dayton, Ky., aged thirty-six, married eight years, no children, no miscarriages; referred by Dr. Richards. This patient had suffered for several years from pelvic pain, backache, pain in the limbs and metrorrhagia. She did not consult a physician until about a year ago, when she was compelled to do so for relief from an irritable bladder. She was not conscious at that time that she had a fibroid tumor, but her physician was not long in determining the cause of the bladder difficulty, which was pressure on the bladder from a fibroid tumor filling up the true pelvis. No medication relieved this tormenting trouble, which gradually grew worse until she developed cystitis of an aggravated form. Her sufferings were very great. When she was referred to me for consultation, March 2, she had not been able to retain her urine for longer than one hour at a time, for more than two months. The tumor was fixed in the pelvis and could not be pushed upwards. Total extirpation was advised and the patient readily consented. It was done March 6. The patient made an easy and prompt recovery; her bladder difficulty improved from the day of operation, and at the

present time she holds her urine for five hours and suffers but little inconvenience. I have no hesitation in saying that in due time she will be perfectly relieved.

Peritonitis is to be dreaded even more than hemorrhage in these cases. My experience convinces me that in almost every case we have the two conditions present. We have periodical hemorrhages extending over long months or even years, with more or less severe pain located in one or the other ovarian regions, or in both, gradually increasing from month to month, until finally the patient is attacked with acute general peritonitis from which she may or may not recover. This inflammation will recur on the slightest provocation. These cases should be operated upon at the first attack, and not be permitted to go on and have a half dozen or more recurrences, each one jeopardizing life. The cause of peritonitis in these cases, in almost every instance, is a pyosalpinx, a suppurating ovary, or both, complicating the fibroid, and it is obvious to every one that the only rational treatment is an early operation. This should be insisted upon in every case at the first attack of peritonitis. The following case illustrates this condition: Mrs. N., age fifty-two, married thirty years, no children; referred by Dr. DeWitt. The tumor extended three inches above the umbilicus. The patient had been conscious of the existence of the tumor for ten or twelve years, but had suffered but little inconvenience until about three years before the operation, when she commenced to have irregular hemorrhages which gradually grew worse, but she would not consent to an operation. For about a year she had suffered considerable pain in both ovarian regions, and the hemorrhage had been markedly increased. The patient lost much flesh, was anæmic and very weak. I saw her on May 20, 1893, when she was just recovering from a sharp attack of peritonitis of some fifteen days' duration. Total extirpation was made May 23, 1893. Extensive intestinal adhesions were found; a pyosalpinx and a large suppurating ovary holding eight ounces of pus which was imprisoned below the tumor in the pelvis,

were removed with the uterus. The patient made a prompt recovery and is to-day enjoying perfect health.

That intestinal obstruction should be one of the complications which might be anticipated in these cases is plainly evident. A small tumor fixed in the pelvis causes intestinal obstruction by narrowing the lumen of the rectum. This symptom can be overcome in the majority of cases after a few days' careful medication, yet the temporary obstruction is almost always accompanied by an acute attack of peritonitis, thereby endangering the life of the patient, as the following case will show: I was called in consultation with Dr. Van Meter on May 7, 1894, to see a patient, a strong, healthy-looking German woman thirty-eight years of age, who has been known to have a fibroid tumor for two years. One year ago she had an attack of peritonitis with complete intestinal obstruction for five days; for twelve hours the patient had stercoraceous vomiting. The tumor was so firmly packed in the pelvis, compressing the rectum to such an extent that the finger could not be pushed by the tumor. The intestinal obstruction was finally overcome only to have it occur again the first of May of the present year. Obstruction was complete for four days, and was accompanied by acute general peritonitis, from which the patient is now slowly convalescing. An operation was advised for removal of the tumor, but not consented to. This patient has obstruction from pressure of the tumor in the pelvis, against the rectum; without operation she will die from this cause at no distant day.

Just as the question of extra-peritoneal or intra-peritoneal treatment of the pedicle in hysterectomy was so hotly contested a few years ago, so now is total extirpation and the extra-peritoneal method being discussed.

The extra-peritoneal fixation of the stump had the advantages over other methods used at that time of controlling hemorrhage and yielding the best results. It therefore became the method that was almost universally adopted. The objections to this method are many and serious. If we use

the extra-peritoneal method and clamp, we not infrequently see the pedicle slough and become a menace to the life of the patient for days afterwards. Not a few die from septic infection and peritonitis from this cause. If the patient makes a primary recovery, she is not in all cases restored to health. Quite a number of these patients suffer great pain afterwards owing to the dragging of the pedicle on the tender abdominal scar, and pressure upon the distorted pelvic organs, interfering with their functions. Not infrequently hernia follows this operation, developing at the point of the fixation of the pedicle. Last and by no means least, the prolonged and painful convalescence which necessarily follows this method is a very serious objection to it.

The new methods which have entered the field and are contesting for supremacy in the hands of leading operators today are, total extirpation and Baer's method. Baer's method is extirpation of the tumor and body of the uterus, ligating the uterine arteries, leaving the cervix and closing the peritoneum over it. Both of these methods have their advocates, but as yet total extirpation has yielded the best results and is the method which I prefer above all others. While I am aware of the fact that I have not had as much experience in this line of work as some operators, yet I have removed the uterus for all purposes sixty times, and so feel justified in expressing my opinion on the subject.

The difficulties attending total extirpation are not so great as one who has never attempted it would suppose. They are easily overcome by one accustomed to performing difficult and complicated pelvic operations. With the patient in Trendelenburg's posture, the time required to perform the operation is no longer than that required in making many of the difficult abdominal and pelvic operations now being performed daily. After ligating off the ovaries and dividing the broad ligaments, the peritoneum is divided across the front of the tumor just above the top of the bladder and across the back of the tumor somewhat lower down. The peritoneum is then stripped down in front, the bladder is

separated from the tumor down to the vagina. After stripping the peritoneum from the back of the tumor, the uterine arteries and their branches are easily secured. The ligatures are placed between the two flaps of the peritoneum, but do not include this membrane in their grasp. The number of ligatures does not usually exceed two or three on either side. One end of each should be left about six inches long, and after removal of the cervix, carried out through the vagina to be cast off through that passage. The vagina is lightly packed with gauze, and the peritoneal edges which were stripped from the tumor are turned in towards the vagina and neatly coapted by a running stitch of catgut. The wound in the vagina is treated as after an ordinary vaginal hysterectomy.

This method has stood the test of experience, and is gaining in favor with the best operators of the present time. Theoretically there is little to be desired in technique, as it is very near perfection. It promises as good results in patients with thick abdominal walls as in those with thin abdominal walls. This cannot be said of the extra-peritoneal method.

By total extirpation there is not as much danger of hemorrhage as there is in ovariotomy, from the fact that in the latter operation the pedicle is transfixed and ligated in mass. Not infrequently the pedicle is thick and short with great tension upon it, favoring slipping of the ligature and consequent hemorrhage. In total extirpation the broad ligament is divided from the uterus and ligated in sections which are not put upon the stretch, so there is no danger of the ligature slipping off. The ligatures do not include any uterine tissue, therefore the tissue within the grasp is not susceptible to any undue shrinkage and resulting hemorrhage. There is no raw surface left in the peritoneal cavity to form attachments to intestine and omentum. There is no sloughing pedicle. There is no distortion of the pelvic organs from the stump being fixed to the abdominal wall, pressing upon the bladder or interfering with the bowels. The risk

from hernia that we have in the extra-peritoneal method at the point of fixation of the pedicle is entirely obviated. There is a comparatively painless convalescence, which is at least two weeks shorter than that of the extra-peritoneal method. And here I wish to reiterate what I said in my first report on this subject, read before the Academy of Medicine in December, 1892: That I was convinced that this method had come to stay, and that the clamp in abdominal hysterectomy would as certainly be a thing of the past as it is now a thing of the past in ovariotomy.

In conclusion I wish to say, that with the present low mortality following total extirpation of the fibroid uterus, we should not hesitate to advise all patients who are subjects of fibroid tumor, if their life is endangered or health destroyed, either from the tumor or complications arising from it, to submit to the operation at once.

TOTAL EXTIRPATION OF THE UTERUS

FOR MYO-FIBROMA COMPLICATED BY PREGNANCY.

CHARLES N. SMITH, M. D., TOLEDO.

Gynecologist to St. Vincent Hospital.

W. D., twenty-seven years of age and married, was seen in consultation with Dr. W. D. Stewart, April 8th, 1894. Her menstrual history, so far as it gave evidence of an abnormal growth of the uterus, was decidedly negative. Menstruation first occurred at the age of seventeen and, except during pregnancy, has recurred at regular monthly intervals. The duration of the flow has been quite uniformly seven days and the quantity has never been profuse. Three and one-half years ago she was delivered, after a normal labor, of a living child at full term. In February, 1893, she had a miscarriage at six months, labor lasting but a few hours. Since this miscarriage she has occasionally experienced an ill-defined feeling as of a body moving from side to side in the pelvis and lower abdomen. The last menstrual period began December 21st last, and continued for seven days. Six weeks after the cessation of menstruation, morning sickness became quite marked and some tenderness of the breasts was noticed. About four weeks after menstruation she detected a hard mass in the left iliac region which continuously and rapidly increased in size. Pain, usually mild but occasionally severe, was quite constant in the lower abdomen. The feet and legs became slightly œdematous.

The patient was of slight figure; weighed about one hundred pounds; was five feet in height; and after removal of the tumor measured but nine inches between the anterior superior iliac spines. Examination showed the lower abdomen uniformly distended by a hard, immovable tumor of the uterus, completely filling the pelvic cavity and extending to within a finger's breadth of the umbilicus. Above the hard mass, and connected with it by a broad base, was a somewhat movable, fluctuating tumor, readily appreciable by the eye, entirely to the left of the median line, extending upward to the ribs and backward into the loin. The lower, hard tumor was extremely sensitive to pressure, while the upper, fluctuating one was so but to a slight degree. The os uteri, firm and patulous, was high up in the left lateral vaginal fornix.

A diagnosis of uterine myo-fibroma complicated by pregnancy was made. The fluctuating tumor was believed to be either, first, a fibro-cyst of the uterus; second, the fœtal cavity; or, third, an ovarian cyst carried up by the enlarging uterus.

Considering the high mortality attending pregnancy associated with hard tumors of the uterus, a total extirpation of the tumor and uterus was advised, and the patient taken to St. Vincent Hospital on the following day. Owing to the small size of the patient's abdomen and the fact that it was already greatly distended, it was not thought advisable to allow the patient to go to full term and then submit to a Porro operation.

April 11th, the abdomen was opened by a long incision and the tumor turned out of the cavity. Examination showed the lower portion to be hard, smooth and uniform in outline. From two-thirds of its upper surface sprung a soft, fluctuating tumor into which both Fallopian tubes opened. Both ovaries were seemingly healthy. The tubes and broad ligaments were greatly elongated and lifted upward as in normal pregnancy. The length of the entire tumor was about double its greatest width.

No fœtal mass could be made out on examination of the cystic portion of the tumor, and the question at once arose as to the location of the fœtus. While it was scarcely believed that the lower, hard mass was a normal pregnant uterus of five or six months, the possibility of such being the case and that menstruation might have occurred once or twice after conception, was taken into consideration. To determine, if possible, whether the upper enlargement was a fibro-cyst or the fœtal cavity, an aspirating trocar was passed through its anterior wall and its cavity, until the point could be detected by the finger placed on the posterior wall. Not a drop of amniotic fluid was obtained—simply blood. Hemorrhage from the puncture was quite free, necessitating the insertion of a silk stitch for its control. It was then believed that the fœtus lay in the lower part of the tumor and that the upper portion was a telangiectatic or cavernous myoma. Believing that, if such was the case, it was better policy to allow the pregnancy to continue under watchful supervision, bringing on a miscarriage if the abdomen became too greatly distended, the tumor was returned to the abdomen and the incision closed. Had amniotic fluid been obtained by the puncture, the entire mass would have been at once removed. The exploratory incision, the handling of the tumor and the puncture and suture of its upper portion produced no subsequent results.

On more deliberate consideration of the case than was possible with the patient on the table and her abdomen open, I became satisfied that the lower portion of the mass was entirely a new growth within the uterine wall and that the fœtus lay in the upper or cystic portion. Strong color was given this view by the fact that both tubes opened into the latter. I then announced to my associates my determination to reopen the abdomen and remove the entire structure as soon as the first incision should have united.

A sound was then passed into the uterus, a procedure which was not considered advisable prior to the exploratory operation. It entered six inches before meeting with the

slightest obstruction. No attempt was made to pass it further because of the danger of inducing miscarriage, which would have been most undesirable.

A few days later, while looking up the very meagre literature of this comparatively rare condition, I found the reports of two quite similar cases. One of these was reported by Munde in the *Transactions of the American Gynecological Society* for 1884, and the other by Ludlam in the *Clinique* of April 15, 1894. Both cases were parallel ones with mine, in that a hard tumor was situated in the lower zone of the uterus while the fœtus occupied a cyst-like cavity above the tumor.

Total extirpation was performed April 26th. Although I would not commend, as a routine practice, the combined method of operating, it was adopted in this case, the uterus being cut free from its vaginal attachment, the bladder separated from the uterus and the uterine arteries clamped prior to opening the abdomen, thus considerably shortening the time of exposure of the abdominal contents. The abdominal incision was made in the linea alba, through the scar from the first operation. Although but fifteen days had elapsed since the exploratory operation, the union of the fibrous structures of the linea alba was uniformly firm and complete. A few small, soft shreds of the catgut which had been employed in closing the incision were found still unabsorbed. The peritoneum was adherent to the tumor for less than one-half of an inch on each side of the incision for about one half of its length. These slight adhesions were separated readily and without hemorrhage. The upper portion of the tumor was covered by the omentum, which, at one point only, was adherent to the line of incision, necessitating separation and the ligation of a bleeding vessel. At no other point were there adhesions between the tumor and contiguous structures. The condition of the silk stitch which had been inserted to control hemorrhage at the point of puncture at the first operation, strikingly illustrated the innocuousness of aseptic silk in the tissues. It was com-

pletely covered over by a layer of organized lymph so like in its appearance to the peritoneum that it seemed as though the stitch must have been buried beneath the peritoneum without wounding that structure. No adhesion to the overlying omentum had occurred at that point. Both portions of the tumor, but especially the upper, had markedly increased in size, necessitating an incision two inches longer than had been required fifteen days before.

Having turned the tumor out of the abdomen, the patient was placed in the Trendelenburg posture, the ovarian arteries ligated, an incision through the peritoneum made across the anterior surface of the tumor, one and one-half inches above the bladder, and one at a corresponding level across the posterior surface. Separation of the peritoneum from the tumor was completed, the broad ligaments divided and the tumor lifted away. The vessels of the broad ligament were then ligated with comparative ease and the ends of the ligatures carried into the vagina, which was packed from above with iodoform gauze. With the exception of the ligatures on the ovarian arteries, all were so placed as not to include peritoneum within their grasp. The ligatures on the ovarian arteries were cut short. The edges of the peritoneal flaps which had been separated from the anterior and posterior surfaces of the tumor were brought into apposition by a continuous Lembert suture of catgut, completely shutting off the vagina and leaving all stumps with their ligatures below, and outside of, the peritoneal cavity, with the exception of the stumps of the ovarian arteries. A fold of the peritoneum was stitched over the raw surfaces of these stumps, leaving no raw surface within the peritoneal cavity. The cavity was sponged dry and closed without irrigation or drainage. The tumor weighed eight pounds.

The patient made a perfectly smooth and uneventful recovery, without hemorrhage, tympanites or fever. The bowels were moved on the second day. The vaginal packing was removed on the second day, and changed daily thereafter until closure of the vaginal vault had occurred.

The abdominal stitches were removed on the eleventh day, the incision having healed by primary union throughout.

The serous discharge through the vagina for the first twenty-four hours was profuse, illustrating one of the cardinal advantages of total extirpation, namely, free drainage, to which, I believe, is largely due the remarkably smooth recoveries seen in so large a proportion of the cases of total extirpation.

DISCUSSION.

DR. REAMY.

The first paper is of peculiar interest to me because of various reasons. I shall confine my remarks almost exclusively to the last point in the able paper of Dr. Reed. This division of the subject, coming from an experienced clinician, signalizes the lines of clinical experiment and study now being followed by those having the largest opportunity and doing the most faithful work. It indicates that the clinician now not only estimates the size of the tumor, the age of the subject, the physical condition of the patient, but he will also inquire whether it is a multiple or single tumor, whether it is smooth or nodular. He will be regulated in the future largely by whether the tumor is single or multiple. If it is a single tumor, as soon as the diagnosis is made, total extirpation should be performed. He founds this upon the fact that a single tumor, other things being equal, will not be arrested by removal of the appendages with anything like the certainty a multiple tumor will be. If several combined make the same size as, or there exists two or three or more with a size each equal to the single tumor, the multiple tumor will be arrested in growth by removal of the appendages more certainly than the single tumor. There is no doubt about the clearness of the facts on this subject and the soundness of the teachings. I do not myself go quite as far as the author, and I must criticise or I will not please the author; he wants me to give my views on the other side on that particular point. In the main I agree with the doctor, but in some instances that have come under my observation, and I have no doubt in cases which have come under his observation, single tumors of the very character he describes have ceased to grow, spontaneously sometimes, under treatment. These

cases do not invariably go forward to the stage demanding surgical interference. The question therefore settles to this proposition: Will the reasonable certainty of growth in this class of tumors justify us in taking advantage of the difference in ease with which the operation is done and the difference in danger of the operation done? I think it might be well enough to keep the case under observation and find out whether it continues to grow, and subject the case to the same treatment as in multiple neoplasm. In other words, I do not think we are justified, because we find a tumor of this character, that does not produce bad symptoms, in subjecting the patient to operative interference, although in the last year or two, in the hands of those who are expert, the mortality of this operation is comparatively so low that the question of whether the woman will survive the operation is not greater than if she had an ovarian tumor, or not very much more at any rate in the hands of a specialist. But that is not the only question; it is a question, but there is another question. Although the woman make an uneventful recovery, it is not settled that she is in perfect health. There are not cases sufficient within the knowledge of the author of this paper, or the authors of the other papers, nor within the knowledge of myself, neither in literature, for the length of time has not been sufficient to determine what will be the influence of the removal of her appendages upon her psychological as well as social condition. That is a question which is in the present day absolutely ignored. My friend talked of the extirpation of the uterus and the fact we know she is cured, etc., but she is not perfectly well; she is without the most important elements of her organization. We must become better students of natural history. The glory of surgery will be when we are able to not only make the diagnosis and classify the cases, but when we will also be able to arrest the growth of the tumor without removing the uterus. Do we advise the injection of some preparation of ergot for the purpose of assisting nature in the removal of these growths? Do we tell the physician that he has the power of arresting these growths in a large percentage of cases? In proof of the fact I have myself observed in the dead room that one out of every five women thirty-five years of age has a fibroid tumor in the uterus. Now, does not this fact indicate to us that there must be an enormous number of these cases in which the arrest of the growth takes place without the physician or the surgeon? My friend in

the opening paper suggests what is indicated by every writer upon this subject, that in neoplasms nature is able to accomplish very much. Now, what are these tumors? They commence in round cells, primarily. That is the first proposition. Second, these are found in close connection with the capillaries. Third, these capillaries are almost invariably undergoing obliteration. Fourth, they are ordinarily encapsulated, not always. What does this indicate? The fusiform cells and the tissue found in a well-developed tumor must not mislead you; I am talking of it when it is a young, tender plant, and you have charge of it. This tumor has blood vessels, but they are not very perfect in the beginning. It is constantly subjected to the paroxysms of the nonstriped muscular fibers in every twenty-four hours of a woman's life, prior to the menopause. It is as rhythmic as the paroxysms of contraction and relaxation during parturition itself. It interferes with the nutrition of these young tumors, and they often undergo degeneration. That, associated with the pathology, leads me to this: The recommendation which has been made, and which was one of the most brilliant contributions, but which has been forgotten, is the use of ergot. Why do you use it in hemorrhage from the bowels? Because you know its marvelous action when injected upon every organ that contains muscular fibers. Therefore, not only were the clinical observations of this distinguished author true, but they also agree with the physiology. You can increase the tendency to the arrest of growth by the injection of the tincture of ergot, or ergot given some other way. I simply want to make this plea: Arrest these tumors while they are young, and save these women coming before us so late that we can only extirpate. I have over and over again in my practice seen the most marvelous success from this. A large number of cases may be cured by the injection of ergot, others by the use of electricity. I will not enter into a discussion of this. I think, as I have always thought, that some methods are best in some cases, and others in other cases. I use various methods in various cases. I commend the paper, and in the main agree with the conclusions.

IMMUNITY.

NOTES ON HOG CHOLERA.

D. N. KINSMAN, A. M., M. D., H. M. W. MOORE, A. M., M. D.,
COLUMBUS.

It is well known that an attack of some diseases protects against a subsequent infection for a variable period. In some this immunity is solid for life, in others it is temporary. In yet others it so far seems impossible to produce any condition approaching immunity. These diseases are called infections.

In some of these a microbe has been isolated by culture and its causal relation to the disease has been demonstrated by inoculation. This has been proven with regard to the microbe of tuberculosis, tetanus, hydrophobia, anthrax, diphtheria, typhoid fever, etc.

In other infectious diseases, although the microbe has not been isolated yet, the course and history are such as to give us good grounds for inferring that they too depend upon a microbe.

These infectious diseases cause no small amount of our annual mortality. At present protection from their infection is only to be secured by complete isolation. Under these circumstances any studies bearing upon this subject become of interest. For this reason we report ours on hog cholera.

We began our observations in 1890. Hog cholera is a violent infectious fever in swine. A single attack produces immunity at least for some years. It is caused by a microbe

which has been isolated in pure cultures and its inoculation in all unprotected cases causes hog cholera. The microbe survives the temperature of our winters, and so this epizootic prevails year after year on some farms in the herds which are successively exposed thereto. The mortality is great, reaching from 90 to 100 per cent.

It resembles typhoid fever in many ways. Its invasion is progressive. There is a daily increase of temperature. 108 degrees Fahr. is not an unusual rectal temperature. The loss of strength and emaciation is great. When the animal survives, the convalescence is long, and it often perishes from the later lesions of the disease.

Autopsies show ulcerations of the tongue, larynx and pharynx, and there is not unfrequently gangrene of the ears. Hypostatic pneumonia is always present in the animals, which die in the second week. The spleen is large and soft, the liver and kidneys show the changes we see in cases of severe infectious fevers in man. The heart is soft, and the voluntary muscles show widespread degenerations. The brain is soft and œdematous, and there are often evidences of meningitis. The lesions peculiar to the disease are found in the large intestines. These are ulcers of all diameters from one-half to an inch or more in diameter. Their surfaces are often black, covered with a heavy exudate, and they penetrate to the peritoneal coat of the bowel. Ulcers are rarely seen in the small intestines. The mesenteric glands are swollen, indurated or softened.

The diagnosis does not concern us here, and the prognosis may be inferred from the rate of mortality.

Hitherto all forms of treatment and no treatment, so far as our observation extends, are of equal value. Many have been recommended but we have found them wanting. Under these circumstances we turned to the study of inoculation.

FIRST SERIES.

First Inoculation.

June 26, 1891. Pig No. 1 received 2 cubic centimeters of culture. Pig No. 2 received 4 cubic centimeters of culture. Pig No. 3 received 6 cubic centimeters of culture.

July 3, 1891. Pig No. 4 received 3 cubic centimeters of culture. Pig No. 5 received 3 cubic centimeters of culture. Pig No. 6 received 3 cubic centimeters of culture.

July 11, 1891. Each received a second inoculation of 3 cubic centimeters of a stronger culture. All these animals recovered. Never were off their feed.

July 20, 1891. No. 6 was killed. The intestinal lesions of hog cholera were well marked.

July 21, 1891. The first three pigs were exposed to a herd suffering from hog cholera. On August 7th, Nos. 1 and 2 were sick. They both died. No. 3 survived all exposure. August 10, Nos. 4 and 5 were exposed to a sick herd, both became sick, one died. Only one pig out of five showed solid immunity as the results of inoculation.

SECOND SERIES.

July 27, 1891. Seven pigs received 1st injection.
August 7, 1891. Seven pigs received 2nd injection.
August 7, 1891. Six pigs received 1st injection.
August 21, 1891. Seven pigs received 3d injection.
August 21, 1891. Six pigs received 2nd injection.

Of the seven one died after his third injection. Of the six, two died after their second injection. Near the end of September these ten pigs were exposed to a virulent focus of contagion. One pig promptly sickened and died; the remaining nine resisted the infection although exposed all winter and the following spring, when they had become fat and went the way of all fat hogs.

Of this series nine became immune, three died from injections and one died from infection upon exposure.

THIRD SERIES.

Nine pigs received three injections each at intervals of two weeks. Ten pigs received two injections each, at the same intervals.

These pigs were exposed on an infected field from December, 1891, till May 11, 1892. Of the nine which received three injections four were sick, none died and five were immune. Of the ten which received two injections all were sick and five died.

These experiments were conducted at Kingston, Ohio. The following is a summary:

Whole number inoculated	38
Killed	1
Died from injection	3
Died from infection	9
Recovered from disease	10
Immune	15

Saved 65+ per cent.

FOURTH SERIES.

October 1, 1892. Twelve pigs received their first injection of three cubic centimeters of an attenuated culture. On October 15th and November 5th they received their second and third injections. Three cubic centimeters was the dose in all cases when not otherwise stated.

November 12th, two of these pigs received three cubic centimeters of a fresh (24 hours) culture. They had no appreciable reaction. On December 3, 1892, two unprotected pigs were procured as checks. These pigs with four of the protected pigs received an injection of a fresh culture. The two checks died of hog cholera as shown by the autopsy, the six protected pigs suffered *no* inconvenience from doses of culture which were fatal to the checks.

FIFTH SERIES.

Fifty-five pigs were secured from the Cincinnati Stock Yards of an average weight of 93 pounds. This herd became infected in the stock yards. They came into our possession May 20, 1893. One pig died June 3, 1893. Cultures were made from this pig which show the germ and confirmed the diagnosis.

Three of these pigs whose temperature showed the severest intoxication were killed and their blood serum collected and sterilized. Two pigs which were sick had already died. Five were reserved for checks. Thirty sick pigs were injected with sterilized serum, one fluid ounce to each hundred pounds. Of the serum hogs, eight died. The checks and two sick when received, seven in number, all died.

Bouillon cultures were made from the pigs which furnished the serum. These were sterilized with heat. Fifteen sick pigs were injected with 22.5 cubic centimeters of the bouillon culture per hundred pounds. The whole number recovered.

SUMMARY OF THE FIFTH SERIES.

Whole number of pigs	55
Killed for serum and diagnosis	3
Checks	7
Treated with serum	30
Treated with bouillon	15
Of those treated—dead	8
Percentage of recoveries of those treated	82.2 %

By the autopsies of the eight pigs which died we found that cholera had absolutely nothing to do with the deaths of five of these pigs. The other three just as surely died from the hog cholera. Taking this view of the case the mortality of our hogs treated by serum and by bouillon was three—a mortality of 0.075 per cent. from hog cholera. The rest of the mortality was due to accidental causes, as may be

seen from autopsy notes which we append that any one may see the grounds on which we base our conclusions.

These figures have demonstrated that bouillon cultures are the best. We do not think the reason for this is far to seek. All infectious diseases probably have two stages; the first is pure toxemia, the second is a mixed infection of toxemia and septicemia. Nor is this condition of affairs peculiar to hog cholera. It is present in tuberculosis, typhoid fever, tetanus, diphtheria, as well as in the stage of febrile reaction subsequent to the algid stage in Asiatic cholera.

The blood serum removed from pigs far advanced in the disease contained in addition to the toxines from the hog cholera bacillus those derived from secondary infecting organisms, and it is fair to infer that they in some way neutralized otherwise successful treatment.

Unmixed bacterial infection lasts but a short time, probably not more than two or three days. We have this problem before us and our next efforts will be devoted to its solution. When the disease is attacked during the period of toxemia, we reasonably hope to cure it.

In hog cholera, as in most other infectious diseases, except in a few explosive cases, the physical lesions kill.

The symptoms which follow the injection of the toxine are somewhat like those of narcotic poisoning. The animal is overwhelmed for some hours, the respirations rapid and the animal can scarcely be roused. When it comes round it begins to eat and in a few days seems well.

The time allowed will not permit further detail. The meaning of these experiments, which have been faithfully and carefully recorded, cannot be mistaken. They reach far into the domain of human pathology and lead us to hope for like beneficent results from this line of treatment in the infectious diseases of man. Results already attained in human pathology tend to strengthen our hopes. We cannot here discuss theories of immunity; for the present we are content to state our facts.

CONCLUSIONS.

I. Hogs can be rendered immune to cholera by inoculations with attenuated cultures.

II. Our experience has shown that the operation must be repeated three times to produce solid immunity. It therefore is not a practical measure.

III. Hog cholera can be successfully treated by the use of its toxines if used during the stage of toxemia.

IV. Bouillon cultures are the most efficient.

DISCUSSION.

DR. W. J. SCOTT.

I am greatly interested in this subject in several ways. Its importance in connection with human pathology I think cannot be overestimated. Now, whether these microbes introduced in this way produce immunity by affecting the organism permanently, as small-pox does in some cases, or in some other way, is a question; and whether in cases already sick these micro-organisms act as phagocytes, so as to eat up the microbes of the disease, is another point. When I first heard of phagocytes, those little devils who eat up the disease germs, I had to go a good ways to believe in the hypothesis, but now I believe there is a good deal of truth in it. A good many of these things are as yet hypothetical, but we are on the way to demonstrate them.

DR. HUTCHINSON.

Does this immunity last for a long time, or does the animal become susceptible again in a short time?

DR. CONN.

The paper starts out with the assumption that all the so-called infectious diseases, contagious diseases, are the result originally of a microbe; that the cause is this microbe. On that assumption I would beg leave to differ from the paper. I have read some, but I cannot see where it has been dem-

onstrated beyond any question of doubt that a microbe, however virulent, can produce a disease in an organism while the functions of that organism are at an equilibrium. One man is just as much exposed to the germs of tuberculosis as another every hour and day of his existence. History shows that families have gone through five and six generations without one of them having tuberculosis. Certain conditions render man liable to infection. We must not give too much importance to germs.

DR. BEARDSLEY.

I am sorry I did not hear the doctor's paper from the commencement, because I was very much interested, and more particularly so from a financial than from a medical standpoint. I simply rise to state some circumstances under which I have made certain observations. I have not used the cultures which the doctor has used so extensively. I simply want to speak of certain treatment given to cholera-affected hogs. In our neighborhood we became infected with hog cholera, and our hogs died off very rapidly. I mixed pulverized charcoal with the arsenite of copper, and gave it to them. The disease stopped at once and the hogs ceased to die. I mixed this with bran and gave it to them freely.

Question. What dose to the hundred pounds?

Answer. It did not make a bit of difference. I did not care whether they died from the hog cholera or the arsenic, and gave them *all they wanted.* They recovered, and after commencing the use of the arsenite of copper I do not think I lost two of them.

As the doctor remarked in the last part of his paper, there are two stages. I believe when you strike the second stage and it becomes general, and the plasma of the blood and the general system become infected with the disease, nothing would stop it, not even the doctor's injection. It is in the first stages, at the commencement of a diarrhœa, that I believe treatment is successful.

DR. GRAHAM.

One question I would like to ask Dr. Kinsman is whether the percentage of cures is greater when the hogs are treated soon after diagnosis or after a longer time. A recent paper on the treatment of diphtheria gives a much larger per-

centage of cures after twenty-four hours than after two or three days. It gives almost ninety per cent. of cures in diphtheria from the injection of serum or weakened cultures, the animals being rendered immune by weakened cultures. I would like to ask if the same thing is true in hog cholera.

DR. KINSMAN.

In the first place, in regard to the form of culture. It is known by all persons who work on the subject of bacteriology that all microbes lose their toxicity upon exposure to light and air. For instance, a diphtheritic culture will in the beginning show an acid reaction, but after standing an alkaline reaction. At the same time the microbes die. We attenuate these cultures in the beginning, and that we have attenuated them we know from the fact that while a single cubic centimeter of the pure culture will invariably kill an unprotected hog, the attenuated culture will not. These attenuated cultures are those to which we resort to produce immunity. The methods are those employed in any bacteriological laboratory. Pure cultures are made and then attenuated. After having made these cultures in the bouillon or the blood serum, they are sterilized by heat, so as to kill the microbes and leave the toxines free in the fluid. The early experiments I detailed to you were made by attenuated cultures of the microbe; the later ones by the use of toxines.

Another point is in answer to Dr. Graham's question. We have found that if we delay the institution of this treatment beyond the third or fourth day, we have passed the stage in which the toxine will be immediately and positively active; that at the end of that time the lesions have begun to take place in the bowels which complicate the condition with septicæmia; and we find in most of our infectious diseases, except in the few explosive cases, that the lesions from the result of the poison cause the death, and not the microbe itself. For that reason we should begin treatment early. In reference to the other question, Are we treating the full disease? We are treating the fully developed disease, because the control cases where we have not treated them died. When we have inoculated them with the pure cultures, they died; when these same cultures are injected into the protected hog, they get well. The protected hog resists these pure cultures, and the unprotected hog invariably dies.

Another point is in regard to the matter of infection. We inoculated hogs and killed them and thus proved our diagnosis. In an epidemic, after you determine post-mortem a few cases, you are satisfied as to the nature of others without post-mortem examination. Now, in regard to one remark that was made, that infection cannot take place when the system is in equilibrium. I take no stock in that statement whatever. It was a fact, that up to the beginning of this century, the human race was almost universally affected with small-pox periodically until it had used up all the unprotected material. Forty thousand died in France during the last century from small-pox. I have been thoroughly convinced, from a very careful study of the subject, that we do by these injections introduce a positive change into the organism, just as we do by vaccination. Now, there is no question but that the germs of small-pox surround us to-day just as before vaccination was known. We have been vaccinated, and those germs go into our bodies without producing any effect. I have no time to discuss the theory of phagocytosis, which, however, I do receive. It is a sufficient explanation to me for many of these phenomena.

IS THERE A BETTER REMEDY IN CHOLERA?

ERSKINE B. FULLERTON, A. M., M. D.

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"By experience we find out a short way after a long wandering."
—*Roger Ascham.*

It is apparent that all modern remedies for cholera have failed. The statistics of the late epidemic in Western Europe show this. Professor Rumpf, Director of Hospitals at Hamburg, places the mortality in the two great hospitals of that city at 48.4 per cent.; Drs. Wyman and Banks, in Sajous' Annual, saying, "there were in round numbers 21,000 cases with 11,000 deaths," a mortality of over 52 per cent. In the epidemic in the Mississippi Valley of 1873, there were 7,356 cases with 3,800 deaths, a mortality of 51.6 per cent. The assertion above made in regard to modern remedies might be so extended as to include all remedies, for even the one I advocate (the treatment of cholera being a great international cause rather than a pursuit, advocacy were here permissible if anywhere in science) failed, and failed signally, but it was because of *methods of administration which we now know to have been useless or worse than useless.*

As the deductive method of reasoning in therapeutics seems at present to be the vogue, it is my claim that from the most strictly scientific standpoint, and from the laboratory of Professor Koch himself come the data that should

lead us to hope the most from, and trust most fully to the remedy about to be presented for consideration. There have issued from this laboratory two lists of agents having control over the vitality of the cholera germ: One of these by Boer, quoted by Surgeon General George M. Sternberg (*New York Medical Record*, October 1st, 1892), of those that kill the germ; the other of agents that inhibit its growth.

AGENTS DISINFECTING AFTER TWO HOURS' EXPOSURE.

Hydrocyanic acid	1	to	1,350
Sulphuric acid	1	to	1,300
Caustic soda	1	to	150
Ammonia	1	to	350
Mercuric cyanide	1	to	60,000
Gold and sodium chloride	1	to	1,000
Silver nitrate	1	to	4,000
Arseniate of soda	1	to	400
Malachite green	1	to	5,000
Methyl violet	1	to	1,000
Carbolic acid	1	to	400
Creolin	1	to	3,000
Lysol	1	to	500
Mercuric chloride (Bolton's experiments)	1	to	10,000
Sulphate of copper (Bolton's experiments)	1	to	500

A glance at the above list will show the impracticability of killing outright the spirilla in the intestinal tract of a human being whom we expect yet to live.

Let us suppose that the patient had in him one quart of the rice-water exudate to be disinfected absolutely in the intestinal canal. It would require, according to the above list, 11.3 minims of Prussic acid of a strength that a whiff of the vapor is supposed to have proved fatal to its discoverer, Scheele, or its equivalent, more than one ounce of the dilute acid; of strong sulphuric acid it would require twenty-four drops, without allowing for any vehicle, for chemical combinations that would at once take place in the alkaline cholera fluid, for increasing or repeating the dose in case of

need, and, so far as known, it would take two hours to attain the desired end.

Under like conditions and to effect the same result, there would be required more than one hundred grains of caustic soda; about four grains of silver nitrate; more than one and a half grains of mercuric chloride; about forty grains of carbolic acid, with which this enumeration will close, as one in four hundred is the strength of carbolic acid necessary for inhibition, according to the list of Professor Koch, and therefore furnishes a clue to the relationship in time and potencies between inhibition and disinfection. One thing stands out clearly from the above, and that is this, the great scientist was right when he said the thing could not be done.

This leaves us to look for the best and least harmful inhibitant, and here, fortunately, we can be in no manner of doubt, as in the same amount of fluid a little more than three grains of quinine, inhibiting one to five thousand, effects that result.

INHIBITORY LIST OF KOCH, WITH ADDITIONS.

Alcohol	1	to	10
Alum	1	to	100
Camphor	1	to	300
Carbolic acid	1	to	400
Ol. peppermint	1	to	2,000
Sulphate copper	1	to	2,500
Corrosive sublimate	1	to	100,000
Quinine	1	to	5,000
Salol (Loewenthal)	1	to	100
Tannin (Cantani)	1	to	200

Forty grains of quinine, roughly estimated, would most nearly find its toxic equivalent in four glasses of champagne, the one making the subject of the experiment feel about as bad as the other does good. The toxic effect of the ordinary ounce bottle of the one, we have no reason for believing to be greater (mythical amaurosis excluded) than a

quart bottle of the other. Yet forty grains of quinine should check multiplication of cholera spirilla in twenty-five pints of rice-water exudate, and if the physician were laboring under any doubt as to the capacity or the needs of his patient, this amount of the remedy could be doubled in the course of a day's treatment, without fear of disastrous results. One-half ounce is reported to have been given in the course of treatment to one patient, and two-thirds of an ounce to another in Kentucky in the epidemic of 1873, both cases of the disease recovering. In fact, as it will, I think, be shown further on, the most of the cases of the disease treated by the remedy having a fatal termination, exclusive of those where a faulty method of administration was resorted to, had this result because of its having been in rare instances rejected by the stomach, or where from other causes there was not a sufficiency of the remedy administered before the patient was hopelessly collapsed or comatose from toxic absorption or toxic retention.

It is not my wish to be considered as favoring in all cases such very large doses of quinine in the disease. That it was so given by some, is true, and that only slight mention is made of any symptoms of cinchonism is also true. That such was the case is fairly attributable to the rapid peristalsis of the disease. The currents, at the same time, being against absorption, the latter did not, in any great degree, take place. In other words, the old objection in regard to the possibility of having remedies absorbed, so long urged as a chief cause of failure in the therapy of cholera, is the very condition most desirable for the end we now wish to attain, namely, *thorough inhibition to be followed sooner or later by disinfection throughout the whole intestinal tract by means of some agent sufficiently powerful to effect promptly these results without being in itself deleterious to the patient.* That twenty or forty grains of quinine sulphate *given always by the mouth and always in powder or solution* is sufficient to have the desired effect in any quantity of rice-water exudate presumably present in the alimentary canal; that after such con-

tents are passed out and with them much of the remedy, there would still be a residuum sufficient to embitter for a time the mucous membrane of the intestinal tract, and the future existence of any bacilli therein retained—that this effect once gained, the treatment thereafter may be *pro re nata*, is my firm conviction. To obtain a like effect the doses of other remedies are too great.

This last mentioned amount of quinine, as I have elsewhere shown (*Medical Record*, December 9, 1892) is the inhibitory equivalent of two and one-half quarts of whisky or brandy; 666⅔ grains of camphor; 500 grains of carbolic acid; 100 minims of oil of peppermint; 80 grains of blue vitriol; 2,000 grains of salol; 1,000 grains of tannin.

That quinine in very minute amounts is capable of having such decided effect in cultures as to lead us to hope that in greater strength it would effect in a short time disinfection of the intestinal tract in cholera, the following statement from Dr. J. C. Graham, bacteriologist of Starling Medical College, is offered in evidence:

DR. FULLERTON:

After a series of experiments, the following conclusions are reached in reference to the effect of quinine on the spirillum of cholera Asiatica. If the spirillum be placed in an aqueous solution of sulphate of quinine, in the strength of 1-1000 and plate cultures be made therefrom at intervals, no growth results after fifteen minutes, and only once in a number of experiments did growth show after ten minutes, and then but two colonies developed, which were first macroscopically visible at the end of forty-eight hours. In these culture efforts and in all other experiments, the plates and tubes were kept in the incubator at from 33 to 37° C. In 1-2500 the number of colonies rapidly decreased in plates made at five-minute intervals up to thirty minutes, beyond which time no growth occurred. In the strength of 1-5000 quinine sulphate, the results have varied. Always there has been inhibition and destruction of a large portion of the bacteria, manifested in the slow growth and in the decrease in the number of the colonies in the plates laid at intervals up to the end of an hour. Twice there was no growth after thirty minutes. In this strength I have not been able to

determine definitely the length of exposure required wholly to destroy the spirilla. The deleterious action of the quinine is shown not only in the inhibition and destruction of vitality, but also in the development of involution forms, when cultures are made from bacteria exposed for any considerable time to the action of the quinine. If the quinine be added to bouillon in proportion of 1-5000 and this be inoculated, no growth whatever occurs. In 1-10000 there was growth in but one of a number of tubes. That the bactericidal effects of the sulphate of quinine depend upon the alkaloid and not upon traces of sulphuric acid present, is certain, because experiments were made both with the sulphate and the pure alkaloid with identical results. A series of experiments was also made with the bisulphate, but the results were uncertain and much less satisfactory than with the other preparations. Control experiments were always made to keep tab on the vitality of the cultures used, and the growths, when colonies were not typical of cholera, were examined in hanging drop, or in stained preparation. It must be admitted that the results given above are incomplete, for it should be shown exactly how long exposure to the solutions of the various strengths was necessary to destroy the cholera spirillum. This much is, however, certainly demonstrated: that quinine in comparatively small proportions has a decidedly inhibitive effect upon the cholera spirillum in cultures, and that exposure to it for a relatively short time kills the bacterium.

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In answer to my own query that gives title to this article, I say, yes, there is a better remedy. It was successfully used in epidemics of cholera from and including that of 1831 to and including that of 1873, and wherever used it accomplished all that could reasonably be hoped from the use of any remedy. It passed out of use for reasons before mentioned, and because when given intravenously or hypodermically, the remedy escapes by the kidneys and does not in sufficient quantity reach the intestinal tract, the seat of the disease germ. A precedent, nevertheless, was thereby established. "Precedent," says John C. Calhoun, "makes the error of yesterday the law of to-day" — the only saying of the great apostle of secession bearing the stamp of approv-

al of Abraham Lincoln. Thereafter it became gastro-intestinal malaria, or mild cholera only, that had been successfully so treated, although as I shall show, the cases formed parts of principal epidemics of cholera Asiatica, giving the usual rates of mortality.

In my previous articles (*Medical Record*, October 1st, and December 9th, 1892, and April 29th, 1893) there has been no reference to theories of the disease beyond the clearly established one of its germal origin. As the sympathetic-nervous-system theory, however, has played so important a part in previous epidemics, thereby leading to the use in treatment of the deductive and fallacious atropine, I have a word to offer in regard to the toxines, the hypothetical part played by them being likely to complicate too greatly treatment in future epidemics.

1*st.* *Is the toxine, like most animal poisons, above the grade of a bee sting, an essential poison, toxic* per se, *or an irritant, one that may be mitigated by dilution?*

2*nd.* *What become of the profound effects attributed to it or them, when the saline solutions set the semi-inspissated blood corpuscles once more afloat?*

The intestinal tract undoubtedly contains the poison or poisons; their absorption during the active stage of the disease under the conditions then prevailing must be more than doubtful. The liver of the polar bear must be full of them, or of closely allied poisons, but while sailors have been sickened by partaking of it, there is no record of their ever having killed the bear. The only symptoms that seem fairly referable to toxic absorption pertain to the so called consecutive fever, remittent or typhoid in type, and these symptoms, it is especially noted by several writers, do not manifest themselves after the quinine treatment.

Before leaving the deductive portion of this argument, it remains to be noted that quinine is the only remedy that promptly and effectually disposes of one specialized disease germ *in situ*, that of malaria, and where these organisms are so low down upon the microscopic verge of life that there is

doubt as to their animal or vegetable origin, it seems only rational to infer that it might—especially in the light of scientific data above recorded—as promptly and effectually dispose of another.

COLLAPSED, COLLAPSING AND QUININE-INHIBITED CHOLERA; STATISTIC CHOLERA, "AMBULANT CASES" (DR. SCHLOEMANN), "THAT CAME AT SICK CALL" (DR. HENRY), EXCLUDED; QUININE IN ALL CASES GIVEN BY THE MOUTH, IN FORM OF POWDER OR ACID SOLUTION.

	No. Cases.	Deaths.	Mortality.
Dr. Bluff (Aix-la Chapelle), 1831	17	4	23.5
Dr. Stephen (Aix-la-Chapelle), 1831	8	0	
Dr. Kosser (Posen), 1831	30	2	6.6
Dr. Close (Port Chester, N. Y.), 1849	1	0	
Dr. Sargent (Philadelphia), 1849	17	4	23 5
Dr. Strange (*Prov. Med. and Surg. Journal*), 1849	19	4	21
Dr. Gordon (Georgetown, O.), 1852	12	0	
Dr. Van Meerdervoort (Nagasaki), 1857–1863	2467	721	29.22
Dr. Schloemann (San Antonio, Tex), 1866	220	3	1.3
Dr. Henry (Nashville, Tenn.), 1873	350	15	4.2
Minima pars fui (Columbus, O.), 1873	5	0	
	3146	753	23.9

The above list more than equals one-seventh of the whole number affected by the disease in the recent epidemic in Western Europe as given by Drs. Wyman and Banks, with a gain of more than one-half in the rate of mortality. But this is not sufficient, and it is my belief that a careful consideration of such facts as the various writers give will show more clearly and truly what the necessary mortality under the quinine treatment in an advanced stage of the disease should be. The only objection that so far has been offered, as against this argument, may be urged against the results of any remedy, namely, that statistics are misleading. Accepting the criticism, it is candidly admitted that the above figures giving a mortality of nearly 24 per cent. are faulty, but in this, *that that rate of mortality is entirely too high.*

Leaving out of consideration for a time Dr. Van Meerdervoort's cases, the quinine-inhibited cases of Drs. Schloemann and Henry, and Dr. Stephens' eight cases as well, the amounts of the remedy given by the latter, two or three grains an hour only, being too small to have perfect results in an advanced stage of cholera, and the two of my own cases not entirely bed-fast but still able to get up to void their stools, there are in the above table ninety-nine cases in the severe stage of the disease with a mortality of fourteen, *i. e.*, 14 per cent mortality.

In considering Dr. Van Meerdervoort's report, it would be well to put ourselves in his place. A comparative stranger with presumably imperfect knowledge of the language, with a prejudice far greater than at this date in Japan to contend against, with doubtless inefficient nursing, and a reluctance on the part of the patient to repeat a bitter medicine in the absence of the physician, usually called in when the patient was far advanced in the disease, with 2,310 of his cases treated outside of hospital, only about 157 of the number in hospital, all these circumstances, as he says in his report, would "prevent a proper control of the epidemic." More than that, it was in the fruit season and "the Japanese eat no ripe fruit, and sleep half naked on their verandas"—both of which statements seem likely to be true in a country where the carpenter in using a saw saws away from himself, in using a plane planes toward himself; in building a house first constructs a roof, and a hostler in management of his charge backs the horse into the stall and feeds him where his tail usually is with us. Besides this, in Japan, as elsewhere, the crash of an epidemic of cholera usually comes within a few weeks, and it is worth while to consider what a number of the average eight hundred patients yearly of his "three different fearful epidemics" must have fallen to his charge daily during such periods, so that it was but indifferent attention that could be given personally by the physician to any one patient. It seems only a fair assumption that with us where there is an average of one physician to five hun-

dred of population, with better nursing, a people less averse to medication and having more confidence in its results, a people of better constitution, and better able to withstand the depletion, which East Indian surgeons say the vegetarian Asiatics do not bear so well as we, the results must have been much better even than his very favorable showing. "In 1854 there occurred in Japan 154,373 cases of the disease, with 101,695 deaths—a mortality of 65.8 per cent. Accepting this as the usual rate of mortality of the disease in that country, Dr. Van Meerdervoort shows a gain of 36.6 per cent. in mortality rate. If under the conditions above mentioned, he could in so large a number of cases effect so great a result as this, it seems but reasonable that under more favorable conditions with us, there should be a further reduction of one-half in the mortality. In other words, with us it should have closely approximated the 14 per cent. mortality rate, a little more than that of pernicious intermittent under quinine treatment, of one in eight.

With the other names on the list of severest cases giving the fourteen per cent. mortality, the deaths are usually sufficiently accounted for. Dr. Bluff says: "Of the four that died one had had choleraic diarrhœa for four days before taking any medicine, and was *in statione mortis* when I was called; another received the medicine regularly but after every dose of the quinine mixture received a glass of brandy (four an hour); the other two cases were amidst the worst possible surroundings, and only one of the four that died was a robust young person." He gave at the rate of eight to ten grains of quinine per hour until improvement, then at longer intervals. The statistics of this epidemic at Aix-la-Chapelle show it to have been 52 per cent. mortality cholera. Dr. Kosser gave six grains every two hours to his first patient, "after that I became bolder and gave it in the most dangerous cases every fifteen minutes, nay, every ten minutes in the same doses." He speaks of many of his cases "being affected in the highest degree." The narrative is that of malignant Asiatic cholera, much of it in collapse, and

his good results (thirty cases with only two deaths) in part doubtless attributable to the fact that twenty three of the number seem to have been soldiers, vigorous young men in full strength when taken ill; but there is another circumstance worth noting, and this is, that *he ran the dose up to the rate of twenty-four to thirty-six grains of quinine an hour, when in his judgment the same seemed necessary.*

Dr. Sargent, whose paper "deals only with treatment we pursued in the collapse of cholera, we say nothing of the simple diarrhœa that recovered under ordinary treatment," says of the four cases that died: "One, a nurse, had been sick a week with premonitory diarrhœa, she partially reacted; another vomited two fifteen-grain doses of quinine and was treated by rectal injections of the remedy thereafter." (Dr. Putelli, Venice, 1836, writes even of his big eight-grain pill: "I have never seen more than three pills rejected by vomiting, and the disease is soon tranquilized and the alvine dejections thickened.") The third case "had been in a drunken condition for three days prior to the attack, and when treatment was commenced was collapsed and nearly pulseless." It is not likely that any but the one of these who vomited the quinine could have recovered under any other treatment already known or yet to be discovered. Dr. Gordon's cases in 1852, and my own in 1873, were undoubtedly malignant cholera. There were besides the twelve cases recovering under quinine treatment in Georgetown, Ohio, six cases, five of which died under other treatment, and the whole number of cases in Columbus, Ohio, in 1873, was one hundred and thirty-eight, of whom ninety died, 65 per cent. mortality cholera, running up to 81 per cent. in the Ohio Penitentiary, where there were twenty-seven cases with twenty two deaths.

So much for cholera already in collapse or rapidly passing into that state. Let us see how it has been with cholera that was quinine-inhibited from an earlier period in the history of the disease. All of this, so far as I am able definitely to ascertain, comes from the Mississippi Valley, and

may be regarded as the tart rejoinder of the Father of Waters to "Mother Ganges." The first of it is comprised in the cases of Dr. Schloemann of San Antonio, Texas, in 1866. How many in the more severe stage of the disease he treated, is not stated, as he especially says, "I wish to remark that all cases that came into treatment in the asphyctic state, and all lighter ambulant cases of diarrhœa, have been excluded. Under the quinine treatment 220 cholera and cholerine patients recovered and three died." Mortality 1.3 per cent. Of the three dying, one vomited the medicine (one-half gramme doses by mouth, of sulphate of quinine), becoming an hour thereafter cyanotic. Another, "intestinal-diphtheritic form with complete anuria." Another, a child four years old, that received but five grains of quinine. He says of the first, it "needs no comment." Perhaps not, but he does not say that he repeated the dose, and especially does mention his disbelief in the use of the remedy in the "asphyctic stage," of the disease. The second case might have died under any conceivable treatment; the child that got but five grains might have recovered perchance after larger amounts of the remedy. He speaks of "the great surrounding mortality" from the same disease; says "our cholera was the real cholera of the Ganges Delta, and not a doubtful hybrid form of intermittent," and made a test experiment that ought to be conclusive, wondering "if the favorable result came from the remedy he was administering, or was due to other accidental and unknown conditions;" he changed for a period from the quinine treatment to that by opium, aromatics and astringents, with the result that "diarrhœa returned in every case worse than before, and the discharges became so threatening that I speedily returned to the use of quinine. After this day I continued the quinine treatment with the same previous good results."

But the most convincing facts of this whole induction are to be found in the disease as it occurred in the Tennessee penitentiary, as a part of the epidemic of 1873. It should be remembered that this was an unheralded visitation of

the disease, its introduction at New Orleans having been denied by the leading medical journal of the South at the time. The facts of the penitentiary epidemic are in brief as follows:

About the first of May, 1873, the authorities in control of the penitentiary at Nashville, Tennessee, had notice that a malignant disease had broken out among two camps of convicts at work along the Memphis and Paducah Railroad. Up to the 13th of May, there were forty cases with twenty-four deaths, showing a mortality of 60 per cent. On the 12th day of that month, seventy-five convicts were sent back to the prison at Nashville, purging and vomiting. On arrival only about one-half of their number could be accommodated in the prison hospital, the rest being sent to their cells; usually, two in a cell, with 250 cubic feet of air space; ventilation being through a fourteen-inch grating in the door of the cell; the bucket to receive the discharges inside the cell door. The diagnosis "scorbuto malaria" was made by the young physician in charge,* and the patients put upon a diet of fresh vegetables and sauerkraut, "with tincture of iron and quinine freely given, chlorate of potash being used as an adjuvant."

But one of the seventy-five patients died, and he so well when sent to his cell "that he received no medical treatment whatever." "The remainder recovered rapidly, and in a few weeks most of them were at work." Dr. Henry further states in a letter received by the writer about one year ago, "I gave quinine by the mouth altogether, freely and at short intervals at first; the cases were usually under control in an hour or two after the administration of perhaps twenty or thirty grains of quinine. Finding its potency for good, I kept it up, using it later on both by the mouth and hypodermically."

* If as great a battle had been fought and won by any general in our late war on like mistaken premises in his reasoning, he would be in training as a presidential candidate, if he had not already twice held the office.

sat reading the classics, and at the same irritating out-of-reach portions of cuticle with an especially devised implement, the sulphur beds of Hecla the while almost within scent? Is it not strange that a Boston dentist should have discovered the anæsthetic uses of a drug that has been known from the time of Raymond Lulli, and that the wise men of Boston of that day should not have been able to discover the discoverer of etherization? It is not strange that after forty years of wandering in the opium wilderness it should have been pointed out by Lawson Tait that a dose of salts was best for peritonitis? Is it not strange that engineers should aver the principle of the cantilever bridge to have been utilized in Great Britain during the dark ages, but that nothing can yet be found of it in the British Encyclopedia? Is it not strange, if true (as Lieut. Bent of St. Louis, Mo., avouches), that old log-books show the north pole to have been sailed over and past a degree or more, a hundred years ago; that they should have gone further for whales in the eighteenth century than for glory since? Is it not strange that a tanner from these parts, who afterwards tanned his way to Appomattox, should in his first skirmish make the practical discovery that "in every engagement comes a time when both sides are weary of the battle, and then the commander who pushes the fight wins it?"

It is a fair question, however, *why* the above favorable results came to be overlooked. The answer can probably be best given in tabular form.

CHOLERA TREATED BY FAULTY METHODS OF QUININE ADMINISTRATION.

	No. Cases.	Deaths.	Per Cent. of Mortality.	Method.
Mr. Spencer Wells (*Lon. Times and Gaz.*, Oct. 8, 1853)---	4	4	100	Intravenous.
Dr. E. A. Parks (*Lon. Times and Gaz.*, Oct. 8, 1853)---	2	2	100	"
Belleisle Hospital Ship (*Lon. Times and Gaz.*, 1866, p. 590) ----------	19	12	63	Hypodermic.

To this must be added the belief that the remedy was generally used in the Mississippi Valley in 1873, when used at

all, in insufficient doses by the mouth, or more usually by hypodermic method. My reasons for believing the hypodermic method of quinine administration to have been chiefly used in the city of Nashville, Tenn., during that year, have been stated elsewhere. There are no better names given in the profession than the above of the dead physician and the yet living surgeon. Their experiments were made, it must be remembered, thirty one years prior to the discovery of the Koch germ, and of its habitat in the human body; and without a doubt, were undertaken to obviate the oft-urged objection that remedies were not absorbed in cholera. Nevertheless, in the above can doubtless be found the reason why Prof. Koch while discussing the effects of iodine and other remedies, fails to say a word favorable to the use of quinine in the disease, *because he knew that it had failed in curing it.* We must not expect everything of our great men. There are limitations even to the greatest intellects. After a greater came and demonstrated the force that holds the universe together and apart, it was never urged as against the fair fame of Kepler that he thought each planetary body had an angel to pilot it through space. No one is infallible. Two equally infallible popes have issued diverse edicts as to whether the clippings of Christ's hair and the parings of his nails, while on earth, ascended into heaven with the "logos." Even the sun has spots, or as Lord Tennyson has more gracefully expressed it,

> "The very fount and source of day
> Is dashed with wandering isles of night."

So far as I can find any reference to quinine at all in the epidemic of 1884 in Europe, it was almost to a certainty used hypodermically. The only mention of its use in the last European epidemic, in sources available to me, was in Russia, in the form of so-called "Botkin's drops."* Twenty

*The celebrated professor reported in 1871 a mortality of 17.3 per cent. only in cases treated with 5 grain doses, three or four times daily by the mouth, or 8 grains given hypodermically when the remedy was vomited. From the result it is evident that, as usual in cholera, it proved to be anti-emetic.

to thirty drops of this mixture was the adult dose, containing two-thirds and one grain of quinine respectively. However effectual these small doses might be as an anti emetic, or in controlling diarrhœa in a mild form of the disease, the doses are insufficient for fully developed cases. One may dam the waters of the Ganges no more than those of the Nile "with bulrushes." Ten grains in powder, diffused through a small quantity of water, or in acid solution, at hourly intervals, until twenty to forty grains have been given, afterwards *pro re nata*, should be the ordinary instructions. The same dose at half-hourly intervals for a sufficient time in collapsed or in foudroyant cases. Smaller doses, perhaps, at longer intervals in choleraic diarrhœa. There should certainly be retained of other treatment, appliances for the restoration of heat, saline hypodermoclyses to supply lacking serum to the blood, morphine hypodermics to allay pain and cramps, with enteroclyses of quinine where, as past experience shows rarely to have been the case, the remedy is vomited; and in the sequent enteritis or otherwise persistent diarrhœa, calomel in small doses should not be lost sight of. That by so treating our patients we may hope for a mortality in collapsed and collapsing cases of about 14 to 25 per cent. only; that by earlier administration of the remedy, instead of the use of other agents that have heretofore permitted so many cases to run on into collapse and death, we may reduce the mortality in such cases to 2 to 5 per cent. only, seems a fair assumption for the best of reasons, *i. e.*, it should be so, and so far it always has been so. Were it otherwise we should have to begin with the school-boy's copybook, to relearn the lessons of life by expunging the oft set copy "What man has done, man can do." In therapeutics, moreover, there would be no such relation between cause and effect as has determined the progress of discovery in other sciences, nor would the philosophy of medicinal treatment have aught to do with "history teaching by example." That reasonable objection may be made in part to the above conclusions, is probable

enough, but such would seem about as pertinent to the general result as that some great traveler, or learned professor of Salamanca, during the pageant at Barcelona four centuries ago, should have arisen and protested, "Here is no discovery, for these be not Indians." That some still doubted after the four voyages were over, after Americus had been here with his stencil plate and indelible ink bottle, after the Cabots, elder and younger, had returned, and Merry England had, in her merry way, because of their discoveries, laid claim to all the land that was of any account, is likely. They were "the doubters and the doubt."

DISCUSSION.

DR. A. M. BLEILE.

The conclusions arrived at by Dr. Fullerton are faultless and impregnable. Some may question his premises.

A. The comma bacillus is the cause of cholera. Ninety-nine per cent. of the writers now accept the Koch theory. Among the opponents are Stricker, Klein and Pettenkofer. They cite the fact that pure comma bacillus cultures have been swallowed by human beings and not caused the disease.

B. Cholera is a local disease. The general symptoms are due to abstraction of water and salts from the blood. The theory of toxæmia is scarcely tenable. The thickening of all the body fluids and reduction of volume accounts for all symptoms satisfactorily.

Changes in spleen, kidney and liver are often found, but not in typical cases. Dr. Fullerton's treatment is in accordance with the accepted theories of the pathology of the disease. Even admitting that there is toxæmia the quinine treatment is indicated most decidedly.

DR. GORDON.

In 1855 I read a paper on quinine treatment of cholera. In this I advocated the use of mercury in solution also. In 1849 I was with Dr. Ackley in Cleveland. Dr. Stevens, of Trumbull County, was treated by quinine method and recovered, and I have continued to advocate this plan of treatment ever since my experience in those early days.

PRACTICAL APPLICATION OF THE PRINCIPLES OF STERILIZATION.

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Every surgeon is anxious to discover and carry out any measure which promises to bring about the speedy healing of the wounds which he makes. Since the time that Lister first brought forward his elaborate technique much has been written on the subject of sepsis, asepsis and antisepsis. We must confess, however, that the knowledge of not a few of the writers did not always equal their zeal, so that their well-meaning efforts, far from helping the cause of which they were such ardent supporters, only produced in the minds of many of their readers a feeling of doubt as to whether any of the procedures advocated were after all of much value. For deliverance from this state of uncertainty and doubt we have to thank the bacteriologist.

It is now agreed that in dealing with wounds cleanliness is an absolute necessity, but between ordinary cleanliness and what we term surgical cleanliness there is a wide difference. The science of bacteriology has now existed long enough to have rendered many of its discoveries absolutely beyond question, and it is to this science that we must look to decide when we are in the presence of this absolute or surgical cleanliness, and from no other source can we hope for the establishment on a scientific basis of a reliable technique to be employed in surgical operations. A knife or a hand may to the naked eye look perfectly clean; even with

the microscope we may be unable to detect the presence of any pathogenic substances, and it is just here that bacteriology comes in and shows us that minute organisms may nevertheless exist upon them which are able to produce severe disease and even death.

The practical, scientific application of an aseptic and antiseptic technique can then be thoroughly carried out only by observing every, even the most minute, detail the utility of which has been proven by bacteriological experiments. In order to become familiar with these details and in order to appreciate the importance of each at its true value it would be well if every surgeon could have at least an elementary training in bacteriology. If, however, he has been unable to secure this, it remains for him to accept as his standard of work the principles which have been laid down by those who have had the opportunity of submitting their methods to the test of bacteriological criticism.

Surgical cleanliness can only be insured by sterilization, and it is the object of this paper to show in brief how the principles of sterilization, which have so far as our present knowledge goes been proved to be the best, may in as simple a form as possible be applied in order to avoid suppuration in wounds and to promote a speedy healing of them. One who has been trained in a bacteriological laboratory cannot fail to see the many inconsistencies that occur during the majority of operations, and while these inconsistencies may to many appear trifling we have learned that in reality they are only too often responsible for the introduction of infectious material into the wound. Any one who is thoroughly conversant with the conditions which underlie suppuration in wounds and septic processes generally, knows only too well how many are the loopholes for infection; to him it seems remarkable that such cases do not occur more frequently. Though it may be true that every wound made by the surgeon contains micro-organisms, it is probable that under ordinary circumstances the resisting powers of the patient will be sufficient to prevent their growth and

development. Experience, however, has taught us that several kinds of bacteria under certain circumstances appear to possess sufficient virulence to be capable of setting up violent local or general infection when introduced into the tissues even of a perfectly healthy individual; and although suppuration following an operation is sometimes to be attributed to a lowered systemic resistance on the part of the patient rather than to some fault on the part of the operator, it must be insisted that this is a very rare occurrence, for in nearly every septic case a rigid analysis of the technique employed will bring to light some sin of omission or of commission to account for it. That there are surgeons who do not pay much attention to a careful technique and yet obtain good results cannot be accepted as a serious argument, and a careful investigation of their statistics compared with those of aseptic surgeons, if a sufficient number of parallel cases be taken, will certainly show the inferiority of the older methods. In any case it is our duty to our patient to reduce to a minimum the risk which he incurs when submitting to an operation at our hands.

Many bacteria are perfectly harmless to the human organism, others vary very much in their virulence and in their pathogenic properties; and it must be remembered that while in order to produce infection the presence of pathogenic bacteria, the "seed," is necessary, there must always be a suitable "ground" in which they can be reproduced in sufficient numbers to cause serious results. Consequently while insisting upon the necessity of surgical cleanliness we do not at all underrate the necessity for skillfulness on the part of the surgeon, and any unnecessary bruising or destruction of the tissues by which their resistance is impaired must be strenuously avoided.

In order to have a condition of surgical cleanliness we must be able, as we have said, to ensure the complete absence of pathogenic bacteria; and this can best be brought about by that process which is termed sterilization.

The application of the actual flame in order to destroy

infectious material is naturally very much limited, and it is fortunate that we have other agents by the use of which we can attain the same results. Of these we shall discuss (1) heat, (*a*) dry and (*b*) moist, and (2) chemical disinfectants. Any or all of these methods may be supplemented by (3) mechanical means, washing, rubbing, brushing and the like.

In proceeding to the sterilization of an article all extraneous material is as far as possible to be removed by mechanical methods.

Sterilization by fire can be employed for doing away with worthless and dangerous objects, such as soiled dressings and the like, and it would afford a most effectual means for sterilizing instruments were it not for the fact that they are ruined in the process.

Sterilization by means of dry heat is effective, but unfortunately this agent destroys many substances of vegetable or animal origin. Added to this dry heat does not permeate the substance to be sterilized nearly so thoroughly as steam heat, and is therefore much more difficult to control. Even in the disinfection of metal instruments it has been supplanted by more convenient and speedy methods, but it still finds an important application in the sterilization of glassware.

For sterilization by means of moist heat one of the quickest agents which we possess is boiling water, but by means of the proper apparatus steam can also be employed for this purpose.

One of the most ingenious methods of insuring complete disinfection is that known as fractional or discontinuous sterilization. The substance to be sterilized is exposed to streaming steam for a certain time on several successive days, so that if after the first day any spores have escaped destruction they are killed by a similar exposure after they have had time to grow out into vegetative forms. Tyndall, Pasteur and others have shown that complete sterilization is practicable with the use of a temperature as low as 60°C., if the process is repeated on three or four successive days.

Steam heat, it is evident, cannot be used for the disinfection of the hands of the operator or the skin of the patient, and certain objects, such as those made of leather or rubber, are destroyed by it.

Antiseptic solutions are still used, but to a more limited extent than formerly and with a greater amount of mental reservation. The ideal chemical disinfectant is as yet undiscovered. It should be easily soluble in water, should possess active germicidal powers and not simply lead to the arrest of the development of bacteria; it should exert a sufficient action within a reasonably short space of time, it should not injure the substances to be disinfected, and should be of such chemical composition that it cannot readily be rendered inert by chemical combination with them. It should not endanger the health of those who handle it, nor possess any very unpleasant odor, and finally it must be comparatively inexpensive. Judged by these standards our ordinary chemical disinfectants will all be found wanting. We have no antiseptics of much power which can with impunity be poured into a wound. Carbolic acid, although a powerful antiseptic, is dangerous when used in sufficient strength to exert its germicidal powers. Corrosive sublimate for a long time occupied a unique place in the list of disinfecting agents, among which it was given the pre-eminence by Koch and many others. The experiments by Geppert, however, which have since been confirmed by Abbott in this country, proved that corrosive sublimate is not so strong a germicide as was supposed, and Halsted has shown that irrigation of fresh wounds with a solution of bichloride of mercury, as weak as 1-10000, is followed by a distinct line of superficial necrosis, which can easily be demonstrated under the microscope. As an irrigating fluid then in the case of fresh wounds it must be discarded. Other chemical disinfectants, as will be seen when we treat of the methods advised for the practical disinfection of the skin, are of doubtful value, and although we still employ solutions of permanganate of potassium and oxalic acid we do not allow

ourselves to lay too much stress upon their efficiency, considering that they play a very minor part in the process.

Assuming then the truth of what bacteriology has taught us, namely, that infection of wounds occurs but rarely through the air, and generally takes place by contact, the end and aim of our surgical technique is to keep far from the field of operation everything which might contain septic germs. In other words everything which can possibly come in contact with the wound must be sterile. We will now proceed to show how our theories can be practically carried out in the operating-room.

Dressings and bandages should be sterilized by steam shortly before each operation. Exposure from three-quarters of an hour to steam at 100° C. serves to render all these substances, if not packed or rolled together too tightly, absolutely sterile. Since bacteria do not multiply on dry substances it is better to place the dressings which have been exposed to the steam in a drying chamber for a short time before applying them. If necessary they can be kept for some time in a closed glass jar previously sterilized.

Tampons and sponges, which are best made of gauze, can be prepared in the same way; they should never be used twice.

The operator and his assistants should be supplied with special suits made of twilled muslin which have been previously sterilized and allowed to become thoroughly dry. When putting them on, the hands should be allowed to come in contact with the clothing as little as possible. Too much attention cannot be paid to the minor points of personal cleanliness. The hair should be kept short and as free as possible from dandruff. If he can avoid it a surgeon should never operate when he is suffering from coryza or from a catarrh accompanied by mucous secretions. The handling of a pocket-handkerchief during the operation of course makes a break in the technique.

All suture material and ligatures should have been previously sterilized. This is best done by cutting them into

proper lengths, winding them on reels, and placing them in glass tubes which are then plugged with cotton and sterilized in the steam sterilizer on two or three successive days.

The operating-room should be kept scrupulously clean, the floor being frequently scrubbed with soap and water, and the walls wiped down with a strong solution of bichloride of mercury. The furniture must be submitted to the same process, and any surface upon which any sterile article is to be laid must be covered for additional safety with sterilized gauze or towels.

Several methods have been suggested for the sterilization of the instruments, but the most practical and the cheapest is by boiling them in a 1 per cent. soda solution. It is the custom to employ for this purpose an ordinary fish kettle, in which the instruments are boiled for 5 minutes. In order to facilitate the removal of the instruments a flat wire basket with two handles which fits into the kettle will be found very convenient. After being lifted from the soda solution they are dumped into a basin containing sterile water, which has been prepared for them. These basins must have been previously well scrubbed with soap and water, rinsed off with boiled water and then filled with a 1-1000 bichloride solution which is allowed to remain in them for an hour. This is then poured out and the basins are washed out with sterilized water, and being again filled, are ready for the reception of the instruments.

Many methods have been adopted for the sterilization of the hands. In the light of bacteriological tests, which have been applied to the methods usually employed, the following must now be considered to be the most reliable. The operating-room suit with the short sleeves having been put on, the hands and forearms are scrubbed vigorously for ten minutes by the watch with a stiff brush which has been previously sterilized by steam, and with green soap, the water being used as hot as can be borne and changed at least ten times. In order to avoid any possible contamination from the neces-

sity of turning the spigots on and off with the hands I have recently had constructed an arrangement by means of which this can be done equally well with the feet. The excess of soap is washed off in hot water, and the hands and forearms are then immersed in a warm saturated solution of permanganate of potassium, which should be rubbed into the skin with the aid of a sterilized swab. After being washed in a saturated solution of oxalic acid until the stain of permanganate has completely disappeared, they are rinsed off in sterilized lime water, and next in sterilized water or sterilized salt solution. Finally they are immersed in a solution of bichloride of mercury (1-500) for two minutes. Just before beginning the operation the hands and forearms are well rinsed in sterilized salt solution to remove any excess of the bichloride. Little or nothing certain can be attained unless each step is conscientiously carried out. An elaborate technique practiced in a slipshod manner does more harm than good by deceiving us with a security which is unwarranted. If the hands now be allowed to come in contact with objects which are not sterile the whole work will be undone. The use of sterile rubber gloves to protect the hands after they have been sterilized will often prove of the greatest advantage, for with their aid we can, without much fear of contamination, often perform the needful manipulations about the patient before the operation begins. After she is well arranged and all is ready the gloves are removed, and the hands having been washed once more in the bichloride solution and again in the salt solution, the operation can be proceeded with.

We will now give a short summary of the steps which are to be taken to render the field of operation practically sterile. Supposing, for the sake of example, that we are dealing with a patient who is to undergo an abdominal section.

(1) She should have a daily bath of soap and water and a vaginal douche of a 1 per cent. carbolic acid solution for three days before the operation.

(2) The hair of the abdomen and pubes should be shaved on the night preceding the day of the operation.

(3) The parts are thoroughly scrubbed with

(*a*) Soap and water, the brush being used vigorously.

(*b*) Alcohol and ether to remove the fatty substances.

(*c*) Bichloride of mercury (1-1000).

(4) A thin poultice of green soap is applied for from one to three hours, according to the susceptibility of the skin.

(5) A compress of bichloride (1-1000) is applied and kept on until the patient is brought to the operating table.

After she has been anæsthetized and placed upon the operating table the compress is removed and the following additional steps are carried out:

(1) The field of operation is scrubbed with soap and warm sterile water.

(2) Sponged with alcohol and ether.

(3) In some cases treated with solutions of permanganate of potassium and oxalic acid, as in the disinfection of the hands, and subsequently irrigated with warm sterile water or salt solution.

(4) Irrigated with 1 litre of a 1-1000 solution of bichloride of mercury.

(5) Irrigated with sterilized salt solution to remove any excess of sublimate.

Of the rules for diet it is not necessary to speak here.

We should aim at as thorough an aseptic technique in plastic work as in abdominal surgery. In the majority of instances, it is true, errors in technique are not so often associated in these so-called minor operations with disastrous consequences as when the same errors have been committed in abdominal sections. Yet there are many instances on record of deaths from sepsis following upon a simple plastic operation, and could we properly analyze the list of cases in which the cause of death has been attributed to pneumonia, to lesions of the kidneys, or other organs, their number would undoubtedly be much augmented. In not a few obscure cases in which death had followed a plastic operation, a

thorough autopsy together with a careful bacteriological examination generally demonstrated that death was due to an infection with pyogenic bacteria. Many of the deaths which we have been inclined to regard as due to acute nephritis are now known to have been caused by infection with associated acute lesions of the kidneys. A striking case which came under my notice recently and made a great impression upon my mind, is perhaps worthy of mention. A woman, 58 years of age, six weeks after a perineorrhaphy gradully developed symptoms suggestive of nephritis. The examination of the urine showed the presence of albumen and of granular and hyaline casts. She gradually grew worse and died a week later in coma. At the autopsy minute abscesses were found in the heart muscle, in the liver, spleen, kidney and intestines, and agar-agar Esmarch tubes made from these organs gave in every case a pure culture of the staphylococcus pyogenes aureus. The portal of entrance was found to have been the deep perineal tissues, where just beneath the line of the wound small foci of pus were found.

Although it is often more difficult to render the field of operation thoroughly clean, and to keep it so during these minor operations than when we are dealing with an abdominal case, these facts teach us that the attempt must always be made. We will therefore summarize the procedures which seem to be the most efficient. On the previous evening the parts are carefully shaved and scrubbed with soap and water, washed off with sterile water, and afterwards with a solution of 1-1000 of the bichloride of mercury. After the patient has been placed upon the operating table the vagina, perineum and external genitalia are to be thoroughly scrubbed with oleine soap and sterilized distilled water. This should take at least from three to five minutes, a liberal supply of soap being used and being well rubbed into the skin. In order to cleanse the vagina a small oblong piece of soap is taken and introduced into the cavity and the suds are rubbed thoroughly into the walls; or a large piece of

absorbent cotton held with the sponge-holder or bullet forceps can be used as a swab. The excess of soap having been washed off with warm sterile water, the external parts are rinsed with a litre of a warm aqueous solution of bichloride of mercury (1-1000) and finally with sterilized water or salt solution. If there are large protruding hemorrhoids, and a considerable surface of the rectal mucous membrane is exposed, the bichloride of mercury must be used with caution, as sufficient may be absorbed to produce toxic effects. Under these circumstances it is well to wash out the rectum with a solution of permanganate of potassium (1-1000) morning and evening for two days before the operation, while on the morning of the operation soap and water only are employed, the parts being finally rinsed off with sterilized water.

Fluids for irrigation, dusting powders, and the various kinds of celloidin, used in dressings, all must be sterile.

It would be impossible now to go into a detailed account of all the possible emergencies which may arise and which, if they are not properly met, may nullify in a moment all our previous efforts. Sufficient, I hope, has been said to show on what principles every detail of our technique must be based, and if a surgeon has once learned to recognize hard and fast laws which tell him what he may or may not do, we can trust to his common sense to successfully overcome all difficulties which may present themselves. We are still in a stage of transition, our surgical technique is not yet perfect, but at least we may feel assured that we are starting out with right principles by following which we may finally approach the end at which we are aiming, namely perfect Asepsis.

DISCUSSION.

DR. J. C. OLIVER.

The thanks of the Society are due Dr. Robb for his able review. It may be stated as an aphorism: No antiseptic should be used if the field of operation is aseptic. From

this it follows that under all circumstances we should be extremely cautious in the use of antiseptic solutions lest we induce superficial necrosis. In tubercular cases we have not a simple infection to combat. The presence of septic or pyogenic germs with tubercular tax our antiseptic technique to the uttermost, and yet we must always keep in mind the possible injurious effects of strong solutions and superficial necrosis.

DR. C. A. L. REED.

There is a certain natural recedence from extreme chemical antiseptics. The laboratory and clinical experiences are converging upon conservative conclusions This has been brought about largely through the abuse of chemical antiseptics in really aseptic fields of operation. Given a condition of surgical cleanliness, which under ordinary circumstances can be attained by heat, soap, water and friction, chemical agents for the destruction of germs are clearly as superfluous as they are mischievous. As a result of this needless chemical contamination of wounds, brought about largely through the use of strong solutions of bichloride of mercury, 1-500 and less, necrosis of tissue has resulted and superficial abscesses have been induced. Many an operator has been made unhappy in self-condemnation over a superficial abscess, which has been induced by the use of strong destructive chemicals for the purpose of warding off and de stroying germs which have really not existed. Mr. Bangtok, of London, has taken the position that a bichloride solution which is strong enough to destroy germs is also strong enough to induce destruction of tissue. He therefore abandons all chemical antiseptics and avails himself of the cleansing property of heat and water. His results are among the most satisfactory in the annals of surgery.

I may be pardoned for stating that I have listened with some surprise to the essayist in his advocacy of the permanganate of potash and oxalic acid method of hand antisepsis practiced by Kelly. If my memory serves me correctly, Kelly, after having published the satisfactory results realized both experimentally and clinically with this method, came out frankly and published certain supplementary observations, which were calculated to negative those which he had first promulgated. I have used this method with some degree of satisfaction, although I believe that the bichloride of mercury is the more effective. I believe that

I increased the efficacy of the permanganate of potash and oxalic acid by supplementing the two with a hand bath of 50 per cent. of the peroxide of hydrogen, but even then bacteria were found upon the nails.

After all, I am forced to believe that we have not added anything to the efficacy of sterilized water, when used with sterilized soap, with a sterilized brush. Progress must be had in the direction of simplicity. Elaborate formulæ, involving the use of complicated paraphernalia, can never be made available by the rank and file of general practitioners, through whose hands any agent must exercise its greatest range of usefulness in the protection of health, or in the cure of disease.

I wish, however, to congratulate the essayist upon his careful and scientific treatment of this subject, and to express my belief that it is by precisive studies, so carefully conducted as have been those which he has recorded, that the truth will be finally revealed.

THE TREATMENT OF FRACTURES

IN THE LIGHT OF ADVANCED HISTOLOGY AND PATHOLOGY.

DONALD MACLEAN, M. D., LL. D., DETROIT, MICH.

The aim of this paper is to present for consideration one or two problems bearing upon the subject of broken bones, problems which the student and practitioner of surgery have always regarded as possessed of special interest, whether viewed from a theoretical or a practical standpoint. The first of these problems to which I invite your attention is the fundamental one as to the source from which new osseous tissue is furnished when from injury or any other cause new bone become a necessity. On this point a vast amount of thought and investigation has been brought to bear by practical surgeons, as well as by the students of abstract scientific problems. Time will not permit us to even glance at the varied teachings of those eminent observers who have from time to time contributed to a solution of this interesting problem. In the list, it may be stated, we find such names as Duhamel du Monceau, Haller, Detler, Dupuytren, Fourens, Rokitansky, Virchow, Syme, Cohnheim, Macewen, and many others, whose learning and experience as students of scientific problems give them the right to speak with authority. As a result of the careful and dispassionate study of these eminent authorities, together with the lessons taught me by my own practical experience, I am disposed to sum up the matter briefly as follows:

The repair of injured or the restoration of lost portions of bone, is accomplished very much in the same way that injured or lost tissues anywhere else in the living body is effected; that is, by the living structures in the immediate neighborhood producing in accordance with their inherent power a more or less abundant supply of what may properly be called fœtal tissue, which tissue, starting out with all the characteristic appearances and functions of those so-called indifferent cells from which, in the process of development of the embryo, all the various organs and tissues are formed, ends in due season in the development of good, solid bone to take the place of that which, from any cause, has been lost or removed. It seems to me a matter of the utmost importance to the practical surgeon, to comprehend the important fact that no matter how old the subject may be, nevertheless, at the point of injury there is to a limited but sufficient extent, an area of beneficent activity in which there is a process at work which is in reality neither more nor less than a reverting to that wonderful process through which the fœtal organism as a whole gradually attains to the condition of completeness when it is able to sustain an independent existence.

And this brings us to the second problem to which I invite your attention, viz., the methods resorted to in the treatment of fractures. The fact is familiar to every student of surgery that anything approaching unanimity as regards the guiding principles of the treatment of this class of injuries, is a consummation which individuals of optimistic and sanguine temperament have occasionally ventured to look forward to, but which, as a matter of actual fact, seems even now to be almost as completely confined to the hazy realm of dreamland as at any bygone time in the history of our art. If this state of uncertainty is ever to be overcome, it can only be reached by a steady and unwavering appreciation of the fundamental knowledge of the structural methods and processes by which Nature herself manages to accomplish the end so eagerly desired and industriously

labored for by the practical surgeon, viz., the union and repair of broken bones without deformity and without impairment of functions.

For a good many years a conviction has existed and has gradually deepened in my mind that in our anxiety and determination to secure the best possible result, surgeons have permitted themselves to overshoot the mark and by their activity to oppose and counteract instead of aiding and abetting the beautiful and efficient efforts of Nature. The old and generally accepted doctrine that a broken bone should be immediately restored to its normal position and form (in common parlance "set") at all hazards, and means applied to retain it in that position, is one which to my mind involves considerable danger. If we accept the doctrine as to the developmental process of repair heretofore described, is it not fair and logical to believe that during that process a gradual method of molding and directing the new, pliable, formative mass of fœtal tissue by gentle and intelligent manipulation, may be so conducted as to secure a result which leaves little, if anything, to be desired? From numerous personal experiences I feel emboldened to promulgate with a good deal of confidence this doctrine of comparative expectancy in the management of cases of fracture. The old doctrine of extension and counter-extension has been taught and practiced for many generations, the means and methods which have been resorted to for this purpose have been numerous and varied, and oftentimes have unquestionably proved to be very irksome and distressing to the unfortunate patient. The simple fact of the almost infinite multiformity of the expedients resorted to in these cases, is of itself sufficient proof of the essential unsatisfactoriness of them all. When the treatment of fractures by plaster of Paris casts was introduced some years ago, and the arguments in its favor set forth with much force and ingenuity, many good, practical surgeons eagerly grasped at it, as the most plausible proposition which had ever been made in this department of surgery. Time and experience have, however,

Thomas Annandale, the latter gentleman being at the present time the occupant of the chair at that time held by Prof. Syme. The paper concludes in the following words: "All of the cases here mentioned were treated without extension and counter-extension. In No. 11 the limbs when compared were found to be precisely of the same length; in No. 2 there was shortening to the extent of one inch from the complication of an oblique fracture of the leg. In the other cases the shortening varied from a half to three-quarters of an inch, but in no instance made any perceptible difference in the gait of the patient." The ages of these sixteen cases varied from two to fifty-five years. I am able to state for my own part that I have followed the example of my great preceptor in this class of cases, and in every instance with at least reasonable satisfaction.

The methods of treatment which have been outlined here with reference to fracture of the femur are equally applicable to other bones, and perhaps the most satisfactory and comprehensive way of illustrating the subject is by relating as briefly as possible one recent case which may fairly be presented as a type of a large class which have been treated, either by myself, or under my supervision by intelligent and faithful assistants. On October 13th last a disastrous collision occurred between two trains on the Michigan Central Railroad. Among those who were injured on that occasion was Miss J. H., a young lady. Her injuries were numerous and serious, but for our present purpose those affecting her legs are the most important, as follows: On the left side there was a compound comminuted fracture of the fibula at the lower third, together with a compound dislocation of the lower end of that bone. The ankle-joint was laid freely open. The tarsal bones were crushed into a mass of shapeless, disjointed fragments. That was not all; the skin throughout its entire thickness was so crushed that it sloughed off the back of the leg, leaving an open space at least six inches in length and four and a half inches in width. The right leg was in very nearly the same condi-

tion, except that the tibia, instead of the fibula, was the subject of a compound comminuted fracture, three inches above the ankle, and the lower end dislocated, laying the ankle-joint freely open. On the whole, the most natural course seemed at first sight to be the amputation of both legs at the knee-joint, and that operation had, as a matter of fact, been decided upon before I arrived at the seat of accident. My assistant, Dr. F. B. Tibbals, having arrived in advance of me, suggested the postponement of the operation at least until my arrival. After careful examination of all the facts of the case, it was decided to make an effort to save the limbs, notwithstanding the fully recognized fact that by making this effort the patient's chances of life might be seriously impaired. Of course, every known expedient to guard against sepsis was used. The most important fact in the treatment of this complicated case as regards our present subject was, that the two legs were supported on soft pillows, no attempt to reduce the fractures or dislocations being made for two or three weeks; that is to say, until the first inflammatory effects of violent injury had subsided. When the parts had recovered from the state of violent irritation consequent upon the severe traumatism, and when the healing process had distinctly declared itself at the seat of injury, the lower end of the tibia on the one foot and of the fibula on the other were, on careful examination, found in a state of necrosis and consequently were removed. When this had been done it was a very easy matter to bring the feet round to their natural relation to the rest of the limb, and in that position they were, without pain or difficulty, securely and comfortably maintained by means of the very simple, cheap and at the same time efficient appliance to which reference has already been made, viz., splints constructed of folded newspapers. Under this treatment the healing process progressed most satisfactorily; Nature gradually produced a mass of solid material to take the place of the lost portions of the bone of the leg, and as this process went on the utmost care was taken by firm

yet gentle manipulation to gradually mold the parts into their normal form and relations. Three months after the accident the left foot became swollen and painful; consequently, chloroform having been administered, I made an incision on the outside of the tarsal region, and with strong forceps removed a large quantity of necrosed fragments of what no doubt once was the tarsal bones, so that in fact it seemed to me and my confreres who were present, that every bone of the tarsus had been removed. The cavity thus made was thoroughly irrigated with weak bichloride solution, and strips of iodoform gauze were inserted to secure drainage. After this radical procedure, all pain disappeared, the patient's general condition improved rapidly, and at the present time I am able to report the case as on a very fair way toward perfect recovery with two good, useful feet. Not only has nature reproduced the ends of the tibia and fibula which were exsected, but the tarsal arch on the left foot seems also to have been completely reproduced. The large ulcers left by the destruction of the skin have almost entirely cicatrized over, the patient's general health is excellent, and she is able by means of a wheeled chair to take exercise in the open air.

The facts of this striking case furnish in my opinion, conclusive evidence in support of the doctrines as to the repair of lost bones enunciated in the beginning of this paper; not only so, but in all truth and sincerity, are we not justified in claiming the outcome of this case as a genuine triumph of true conservative surgery?

DISCUSSION.

DR. DANDRIDGE.

I am sure the Society all agree with me in being grateful to the doctor for bringing up this subject and presenting it in so attractive a manner. While this subject is always old, it is always new, and nothing appeals so strongly to the surgeon as the proper treatment of these cases. So many of them are beyond attaining the ideal result, and the doc-

tor is so often made the victim of this; but it is not appreciated by the people generally, and certainly not by the tribunals before which these cases come. I would suggest that it might be well for the speakers to give definitely the treatment which they have found most efficacious in fractures of the femur. Of course, the philosophy of the doctor's treatment has been very suggestive, very thoughtful, and I hope will call forth comment and discussion, but I think probably it would add to the value of the discussion as a whole if all the speakers would dwell especially upon their individual practice in the treatment of fractures of the femur.

DR. LEONARD FREEMAN.

These fractures are very important. A point which has not been mentioned is that in fractures of the femur with shortening which cannot be overcome, in which the fragments cannot be put in place, it would be perfectly proper to cut down on the femur and adjust them with the fingers. I met such a case in the hospital recently. There was in that case a wound, and I had to enlarge it. This fracture was near the knee-joint, and so close that I thought at first perhaps I had opened the capsule. In these days of surgical cleanliness I can see no possible danger in such procedure. If the fracture is a transverse one, especially if there are many spiculæ of bone, it can in this way be more easily adjusted. If it is smooth, it would probably be much more difficult; the edges of the bone would have to be drilled so a wire could be passed through. With a chisel they can be roughened so they will catch into each other. In the drilling, however, the bone has to be so thoroughly exposed and the periosteum stripped off to such a distance that it might be undesirable.

I would like to speak as to Colles' fracture. In Colles' fracture the radio-carpal ligament breaks the radius by strain. The periosteum, passing from the proximal to the distal fragment, binds the two fragments together so that the lower one will not slide on the upper, and the fragments cannot be easily replaced. The way to overcome this is to over-extend the hand in the direction the injury took place, thus making everything loose, then with the thumb the lower fragment can be easily placed in its proper position. It goes in place often with a double crack, as I have heard it, almost like a dislocation. After being replaced, there is nothing to get it out of place, and it is not

necessary to apply any splints whatever to such a fracture, but from the medico-legal aspect it is perhaps well to apply some simple dressing.

DR. HERRICK.

The paper deserves especial consideration because of the distinguished source and radical character of the suggestions offered. They are somewhat in conflict with the teachings and the practice of the profession. In the first place, we may mention the principles of the repair of fractures in the paper. My preceptor on the repair of tissue was Paget; his opinion is that the exudation, the result of lesions of tissue and the result of inflammatory action, is the medium of repairing tissues. I believe his idea is that the periosteum specially and the endosteum, control the supply of the material. In proportion to the condition of development of the animal and the age of development in the individual is the reparative power facilitated or impaired. The popular idea in the profession has been that a fracture should be early adjusted, "set," if you please; that the proper time to do this is before the reaction, during the collapse of the patient under the influence of the injury. We now think it is perfectly proper for the patient to go over the period of collapse and reaction. Now, as to the question of maintaining the fragments in position without injury to the parts. My friend from Cincinnati speaks of his cases of Colles' fracture. I think that the whole member should at least be carefully and suitably supported. In fractures of the thigh, toward which the President has drawn the discussion, a condition of relaxation and rest is to be desired. This encourages nutrition. Still, it is a fashion and custom to resort to extension. I have now a fracture of the thigh upon an inclined plane. It has done remarkably well. Of course the correct treatment to be adopted must be decided in each case. In reference to massage, I hardly suppose the doctor would recommend such manipulation to get the fragments in position. This it seems to me would be undesirable at that stage and would cause only increased inflammation. I do, however, think there should be a careful massage at the proper time, and bathing and flexion of the joint. These, however, no physician here will accept as rigid rules at the bedside.

DR. LARIMORE.

I am like Dr. Herrick. I have in my mind the imperfections of old theories of the repair of bone, and recent developments cause me to believe that I will have to accept new views. I am not in such a rut that I cannot get out. There is one thing I shall be very slow to do, and that is, to discard the orthodox treatment in fracture of the femur for fear of the results that may follow, such as a suit for malpractice.

DR. FORBES.

Twenty years ago Sayre tried to prove that we need have no shortening at all in fractures of the femur. Our friend now, it seems to me, thinks we must always have shortening and plenty of it, or at any rate that shortening is the rule. I am a little like the last speaker, and think that to let go all these safeguards will certainly expose the physician to criticism and malpractice suits very often. Furthermore, what harm can it do to follow in the line of safe precedents in so far as the use of extension is concerned? Often upon arriving at the bedside of the patient I have found four inches of shortening in fractures of the femur. In my experience this condition cannot be permanently remedied without extension until union has occurred in oblique fractures. I have never followed such a practice. I believe it is erroneous, almost pernicious, and I cannot acquiesce to that part of the paper. I have always made extension, and have never seen any reason for not doing it, but I have seen many cases where shortening has occurred because extension was not made. That shortening is a disability as well as a deformity none of us will deny. Furthermore, in allowing the contraction to take place, there will be some shortening, and you will have the points of the bones sticking upwards and downwards, but by the act of extension you can make adjustment. I have usually applied adhesive plaster, in strips cut a yard or so long, commencing at the knee or above the knee and put on spirally, extending six or eight inches beyond the foot for fastening to the foot-piece. I have never had a malpractice suit, and my respect for the author of this paper is great, but I cannot let these cases go and take care of themselves, for we will not only be charged with cruelty to our patients but will likely be the subjects of malpractice suits. The real ancient treatment was to let

fractures alone, to let them go without extension. It would seem to me that the paper is a step backward instead of an advance.

DR. DANDRIDGE.

Considerable stress has been laid upon the surgeon protecting himself, even by the use of unnecessary apparatus. I think we must do what in our judgment is best for our patients, and face the consequences.

DR. MACLEAN.

I should feel a good deal disappointed if my paper had raised no discussion or found no critics. I fully expected that. At the same time, in criticising my paper I would like the Association to criticise what I have said, and not what they have devised. I did not say and I do not advocate the practice of allowing fractures of the thigh to cure themselves I would not have the audacity to face such a learned body as this with such a thing as that. What I did object to, and what I do solemnly protest against is that belief, in which we have in times past trusted to a great extent, namely, that we could really accomplish any material benefit in fractures of the thigh by our so-called methods of extension and counter-extension. I claim that our efforts, so far as that part of the treatment is concerned, however well intended and well directed they may be, are futile. I do not believe any method of extension or counter-extension has ever been invented which would extend or counter-extend to any extent. For example, you put a patient with fracture of the thigh under extension or counter-extension by any method you please, and a day or two afterwards you call on your patient, and what do you find in a very great number of instances? I have often found the weight on the ground and the patient propped up with pillows, and that is an experience I daresay you have all had. So that my contention is that, first of all, extension and counter-extension, from one reason or another, is rarely carried out in the treatment of fracture of the thigh or the other fractures. We have fractures of the humerus, fractures of the bones of the legs, fractures of the ribs, and other fractures, to which we do not apply extension and counter-extension. Why should it be more necessary in fractures of the femur than of other bones? But if this doctrine de-

prives the surgeon of the old hope and trust in extension and counter-extension, I want to give him something better instead; I want to give him the rational, scientific, honest method of treatment. Keeping the mode of formation of new bone in view, I propose that the physician shall watch it closely, and keep the parts in apposition by means of sand-bags and timely manipulation. You can thereby exercise gentle continuous influence by which you ultimately secure union in good position, with a minimum of discomfort. I would certainly be the last to urge leaving the fracture of the thigh to take care of itself. I would suggest not less but *more* care, observation and continual attention, in the treatment of it. And then there was one other remark made by a gentleman, which certainly is a very uncomfortable one, and that is that we should not question or doubt what our forefathers have done; we should be satisfied with the precedent established by them Now, if any profession has passed through skepticism, it is the medical profession. It is the basis of our progress. If, when I graduated from the University of Edinburg, I had said this of what was there taught me, what would I have accomplished? I have the utmost love and regard for my preceptors, but when it comes to a question of opinion, to a question of advance, to a question of accepting their doctrines, I hold that any man who has opinions has a right to act according to his convictions. If I have set going here a new train of thought in regard to the subject of fracture, I certainly have every reason to be satisfied with my effort.

THE RATIONALE OF SYSTEMATIC ELIMINATIVE TREATMENT OF TYPHOID FEVER.

ROBERT PETER, M. D., CANAL DOVER.

The most promising eliminative treatment is ideal prophylaxis. To stamp out their causes, is the best preventive of diseases. Surely the millennium in our art will have dawned when we shall know how to successfully meet the etiolgy of every disease with absolute principles of operative prevention. Our efforts must remain inglorious without well-directed enlightenment. "An ounce of prevention is worth a pound of cure," is an adage old, but by no means as yet worn threadbare. Its full achievement is not visionary, but becomes more and more real with the beacon-light of knowledge. "We must educate or we must perish."

It is manifest that living organisms are constantly being invaded by ubiquitous mycotic parasites. Many of these invading guests are of more or less toxicity; but not always finding congenial soil, they and their products are promptly eliminated without resentment on either part. There is therefore no doubt that at times trespasses by the most toxic and pathogenic germs are often only borne with impunity. Why not? Is it not frequently that we encounter only a limited number of cases of sickness in a family in which all of its members were equally subjected to, and must have likewise partaken of the same exciting cause? Hence it would seem that the most important question that could suggest itself to us were, how can we insure the least amount of disturbance and injury toward an infected organism in case of the different mycoses? The

key to this problem is obviously *elimination.* Successful elimination in all the several bacterial processes can obtain realization only so soon as we shall learn how to secure it.

The province of our present undertaking is to examine into the rationale of systematic eliminative treatment of typhoid fever. This is no innovation, as might be supposed, for, after all, this is Nature's only method of eventually getting rid of the disease and gaining recovery. But the vast importance of this matter is, to know how we can expedite the process of elimination, to reduce mortality and long suffering from this usually wearisome disease. The consideration of this subject has hitherto not only not received its merited attention, but has even been misconceived. There is no question that the most common plan of treatment of typhoid fever has so far rather been to "feed the fever" and wait for results, trusting to luck and time for its elimination; but ultimately, "to the victor belong the spoils." The plan which we intend to study on this occasion, is to feed the patient and to show how we can promptly eliminate the causes; thereby defeating its usually long and severe course and all the dire and loathsome, even if not always fatal, train of phenomena that in the past has accompanied this disease. In short, it means to mitigate, and to abort typhoid fever on the ninth to twelfth day, if eliminative treatment is employed early enough and *lege artis.*

The rationale of any treatment of disease should be founded upon proper conception of etiology and pathogenesis. We will therefore examine into these first, to see what happens in the process of typhoid fever, and whether the plan of systematic elimination proves feasible enough to commend itself.

At this late date no one will longer doubt that the pathogenesis of typhoid fever is induced by the toxic ptomaines which obtain in presence of *bacilli typhosi;* that to this purpose, the intestinal tract with its immediate adnexa of minor byways becomes the real habitat of the germs while engaged in this specific process; even though the bacilli have

been found in the spleen and liver, they were always in a stage of involution, showing that they can not long survive there. These bacilli have a predilection for the lower part of the ileum, as in this region the intestinal contents are perhaps most alkaline. Their multiplication is extremely rapid, so that the intestinal contents in a few days teem with countless numbers. The production and accumulation of the toxic ptomaines keep pace with the increase of the bacilli. It is found that these toxines produce local as well as constitutional effects. At first these effects are mild; but they increase in intensity with the growing cause. The first local effect is hyperæmia and swelling; the cells of the part are stimulated, causing them to swell and increase in rate of multiplication. This occurs at first only in the more accessible superficial surfaces of the surrounding tissues. As the bacilli increase, the accumulation of their products becomes more abundant and concentrated, and with time the effect grows stronger and deeper. As the follicles are in close proximity, closely surrounded by their blood supply and by the lymph sinuses into which empty the lacteal ducts of the surrounding villi, they become reservoirs to which are constantly conveyed both poison and bacilli from the intestine. In consequence of their obstruction from swelling, the slow passage of fluid through some of these small follicles into the intestinal lumen favors such a degree of concentration of the poison and prolonged contact with their walls that their structure is eventually overcome by *coagulation necrosis;* which is simply the preliminary step to tissue disintegration by the bacterial process. Then these follicles are prepared to become *loci minorium resistentiarum*, favoring implantations of pyogenic and perhaps other germs, that soon will be established the time-honored, loathsome ulcerations of typhoid fever. It is then a mixed infection, a process of *symbiosis*; or, when the typhoid bacilli relinquish the field of action, it may become one of *metabiosis.* From these same sources, or *loci*, metastases may also sooner or later follow. The bacterial poisons have such a direct effect upon

the central nervous system, that the inherent strength of the different functions and tissues of the living anatomy are severely put to test. The constitutional manifestations of fever, delirium, tremor, lethargy, etc., result from the profound toxic influences upon the central nervous system. They are determined by the amount of poison in the body, in different individuals by the varying degrees of susceptibility, or by the varying degrees of virulence of the bacterial products themselves. However, we must leave this necessary digression incomplete, since we have only time and space here to single out such few points of etiology and pathogenesis as have direct bearing upon the rationale of eliminative treatment of typhoid fever.

From the preceding brief epitome of etiology and pathogenesis we glean the facts, that the process of typhoid fever is in the beginning merely one of intoxication or drunkenness, solely in consequence of absorption of toxic ptomaines in the bowel; that as the bacterial products accumulate they concentrate, and in consequence the tissues are involved in disintegration and the process signally becomes one of septicæmia, and later on, if metastases occur, may even assume the nature of pyæmia. These facts are borne out by the characters of the temperature curve. During the first seven to nine days, the fever is progressive from day to day, but the evening exacerbation is at least from one and a half to two degrees or more higher than is found in the morning; after this period, the fever has reached its highest point, and it only then assumes its more continuous type, characteristic of septicæmia; but if metastases should eventually take place, the type of fever may thus become more or less irregular in form. These facts with reference to the septic nature of typhoid fever are further demonstrated by the enlargement of the spleen and sometimes of the liver, and by the appearance of a rosaceous rash over the abdomen and by light ochery stools; all of which are only rational signs of the septic processes of so-called septicæmia and pyæmia.

The *indicatio causalis* therefore is to promptly and effectu-

lethargy and tremor soon cease; and appetite and strength return. The appetite is often one of the first things to improve. Therefore let the patient eat anything he may desire. It will not harm. As the waste of fluids by eliminative treatment is considerable, there is created an instinctive desire for its replacement; hence the patient should be encouraged to take to him or herself all the liquids that can well be borne. It will not lessen the appetite or the digestion, nor distress the patient, but will only serve the purpose of replacing loss of fluids and help to dilute the ptomaines, as well as flush the kidneys. We ascertain from these facts, that under systematic eliminative treatment of typhoid fever, the patients regain their appetites for food and drink; hence, what is lost by elimination is again promptly replaced by return of appetite, and in fair exchange there is no robbery. The old heresy of not allowing anything but the liquid kinds of food is an exploded idea. The distress and disturbance in the digestive tract are occasioned by the presence of the typhoid poison and not by the food or drink. Eliminate the poison and nutrients will be borne well. Local irritation is not excited by eliminative treatment, as might be supposed; but the cause that *does* irritate is thereby removed. Disintegration of tissue is the consequent effect of bacterial poison, and it will cease as soon as the cause is eliminated. The earlier the treatment is begun, the prompter and better is its effect. An early diagnosis is therefore very desirable, as the loss of strength and body entailed as a result of the typhoid poison is so rapid and unmerciful.

The *modus operandi* of catharsis is to drain the body-fluids into the intestine; to excite peristalsis and expulsion of intestinal contents. The amount which is thus drained off is very great. There can therefore be no doubt of clearing the intestine of bacteria and their products which it contains. In this way and by encouraging ample ingestion of drinking water, the fluids which are taken up by the lacteals and carried into the general circulation, are attenuated and their

baneful effects gradually overcome. Any purgative may be prescribed. A good selection is podophyllin.* The podophyllin has the advantage of directly increasing the secretion of bile, which is regarded as the best and as nature's own antiseptic agent against the *bacilli typhosi*. It is to be given in doses of one-eighth to one-fourth of a grain every six hours; this will usually insure from four to six stools within every twenty-four hours of its use. If we wish a more vigorous effect, pH. podophyllin comp. may be used. But suppose that the stools be already too frequent, before the treatment is to begin; what then? In that case, we would give according to age and circumstances, from three to six grains of calomel, in broken doses, say one-eighth to one-fourth of a grain every half hour. This will allay irritation and remove the irritating gases and other toxic intestinal contents which are causing these *frequent irritative*, but *not* eliminative stools. The eliminative plan of treatment rather soon establishes a tendency to make the stools grow less; purgation can then be regulated according to desired effect.

Purgation by irrigation of the bowel has only direct effect on the colon, as the process is interrupted by the ileo-cæcal valve, not allowing the water to pass beyond, into the ileum; but it has an indirect effect upon the ileum, as by its presence it excites peristalsis of the ileum, as well as of the colon, and the offal is propelled into the colon. The ileum is designed more for digestion, and the colon more for a dumping ground, until the rectum is ready to receive the effete fecal matter, to expel it through the *sphincteres ani*. Hence there should be several irrigations in succession, to accomplish thorough cleanliness of the larger bowel. Cool water should be used. During its use the body temperature will sometimes decline one to several degrees. The last injection should be smaller and allowed to remain. It will be taken up from the bowel, the volume of body-fluid thereby increased, and eventually the kidneys also flushed out. This

*J. M. Deam, M. D., New Carlisle, Ohio, in *Columbus Medical Journal*.

is especially desirable when from some reason or other the patient is somewhat disinclined to drink a sufficient quantity of water. When the use of both the cathartic and irrigation is decided upon, irrigation should be made immediately after each stool resulting from the cathartic. In making the irrigations, a rectal tube, fifteen to eighteen inches in length, should be used. While cold baths are a most excellent expedient to reduce temperature and stimulate the heart's action by increased blood pressure occasioned by absorption of water, they have only an indirect eliminative effect, mostly from the absorbed water passing through the kidneys when it leaves the body. The cold baths may be used in conjunction with the other eliminative methods, in case a high temperature should persist; but their use becomes superfluous when the other more direct methods of eliminative treatment are carried out early and with fidelity.

At times the *indicatio symptomatica* may suggest some tonic treatment. Quinine may be given in two-grain doses every three hours. A good tonic is nux vomica, to be given in one-fourth grain doses every three hours; but if loss of strength becomes extremely marked, syr. hypophos. comp. with strychnine, one-twenty-fourth of a grain to the drachm of syrup, should be administered every four hours. This adjunct treatment will only enhance the good results of eliminative treatment.

It is not necessary to consider how to treat complications, as with systematic eliminative treatment carried out thoroughly and promptly we need expect none. The degree of comfort enjoyed by the patients under this form of treatment, itself is a boon. Sometimes the eliminative treatment will so promptly modify, improve and abort typhoid fever, that at first one is apt to feel like doubting the correctness of his own diagnosis.

The best result from eliminative treatment of typhoid fever, is abortion of the disease. This is only possible when the treatment is undertaken early, say not later than the fifth day. Cases coming late under observation, *i. e.*, after

ulcers have formed, is a misfortune, as then abortion of the disease is out of the question. Yet their further course can be greatly mitigated, even if the treatment is begun so late. Objections may be urged against such treatment when ulceration has been established. It might be feared that perforation or hemorrhage be provoked thereby, in case deep ulceration exist. Is this reason that we should allow the caustic action of cell destruction to go on in the bowel, or may we still try to attenuate and remove by eliminative treatment? Purgation does not only not increase, but it actually diminishes the danger of perforation.* We get rid of irritating matter and gases which were exciting violent peristalsis. Therefore the increase of peristalsis by the purgative is not a radical change, but simply an increase of rate of such movement. The expulsive movement in the usually diseased portion of bowel is not so much increased as is its free secretion, favoring its flushing out. It is evident that clearing out a distended bowel removes the flatus, and prevents these structures which form the floor of the ulcer from becoming thinner still. Distention of the bowel results from paralysis of the muscularis in consequence of the action of the typhoid toxines on the nerve-centers. If by purgation the cause of paralysis is gotten rid of, the muscular tone returns, and the condition most favorable to perforation is thereby removed. Hemorrhage is the result of pressure from *within* a vessel, breaking through its necrosed wall. Distention of the bowel by gases stretches the vessel, and thereby increases more its risk of breaking than in a bowel which is not so distended, even if the treatment should somewhat increase the peristalsis. A blood-vessel that will not break from its pressure within, will also bear a slight increase of vibratory movement in the membrane in which it is lodged. Therefore we can better afford to trust our patients to the eliminative treatment, than to trust them to the uncertain mercies of an unmitigated septic process.

In the late stages of the disease, however, we believe irri-

* W. B. Thistle, M. D., Toronto, Canada, in *N. Y. Medical Record.*

gations used alone to be the best form of eliminative treatment. From two to four thorough irrigations should be made in a day, according to the indications. Antiseptics used during late stages of ulceration seem at that time to be the most useful and effective. There are none better than the carbolic acid and iodine combination. The combined tonics of iron, arsenic and strychnine come in well in the late stages of ulceration, as adjunct treatment.

In conclusion, we wish to state once more, elimination which does not *effectually* eliminate, is not eliminative treatment and it must be pushed still *more*; that *early* begun and *effectually* carried out, it will abort typhoid fever by the *ninth* or *twelfth* day; that if not employed until late, it will still mitigate the disease and give comfort to the patient.

TYPHOID FEVER.

JOHN E. WOODBRIDGE, M. D., YOUNGSTOWN.

The awful mortality from typhoid fever in Chicago, in Philadelphia, in Pittsburgh, in Washington, and in many other cities and in many rural districts throughout the United States, and the recent outbreak of the disease in St. Louis, in Buffalo, in Northern Michigan, in North Dakota, and in many other places, coupled with the well-known fact that this malady manifests a marked preference for the young and vigorous of both sexes, fully attest the importance of my subject. The interest of the medical profession in the subject is made clearly apparent by the enormous number of letters that have deluged my mail since the publication of my first paper under the title "Can Typhoid Fever be Aborted?" These letters, coming as they do from almost every part of the United States, and some from beyond its boundaries, indicate that this interest is general and widespread, while the dense ignorance of some of the simplest problems involved exhibited by the criticisms of some of those who have essayed the discussion of my papers, together with the contradictory theories and irreconcilable inconsistencies of the writings of different learned authorities, demonstrate the necessity of rewriting the entire literature of typhoid fever. But it is yet too early to do that; we know too little of bacteriology to write a literature of this disease; we know, too, too many lessons that must be unlearned before we can study it properly and well, and those who have abundance of material and the best opportunities for observation in the great hospitals seem most loath to

give up the false theories that seem so dear to their hearts, as, for instance, "since typhoid fever, like a majority of specific infections, runs a course uninfluenced by any known medicines," * is a statement which with unimportant modifications has been so long and so often repeated that it seems iconoclastic to attempt to break its force. Realizing fully what it means to question this statement, and thus attempt to convict all of the great teachers of having taught errors that have cost millions of lives, I have endeavored with the limited means at my disposal, to make my position impregnable. For this reason I have striven to avoid the discussion of scientific problems, and confined myself to statements of facts that have been proven or are easily susceptible of proof, believing that I shall accomplish the greatest good in the shortest time and ultimately benefit the greatest number by first demonstrating that typhoid fever can be aborted, and leaving the speculative discussion of unsettled scientific questions to the future.

Since the early part of July, 1893, I have read three paper in my local society in which I gave the names and residences of a large number of cases of typhoid fever which I had treated during the preceding twelve years without a death, and showing an average duration of treatment of about ten days. In these papers I reminded the members of my society that in 1880 I had condemned all known methods of treatment of this disease, had given the society my idea of the correct treatment and foreshadowed its results; that in 1882 I had declared in the society that hemorrhage of the bowels in typhoid fever would be unknown if the disease were properly treated, and that in 1890 to emphasize my statement that typhoid fever could be aborted, I offered to recompense any member in the usual fee for every day that I had to visit a patient after the tenth day of treatment. With each of these papers I presented the history of my cases up to date, exhibiting the charts, and these charts

*Johns Hopkins Hospital Reports, Vol. IV, No. 1, 1894, by William Osler, M. D.

having been exhibited, my statement that I had had no death from typhoid fever for twelve years made, and my claim that the disease can be aborted and that it should never cause death having been discussed in my local society, where several of the ablest members verified the charts of the cases they had seen and endorsed my statements of facts as far as they had come under their observation, can leave no doubt in the mind of any thinking physician that I have done and can do exactly what I claim. In one society, amongst entire strangers, my charts were severely criticised by a gentleman of undoubted ability, who said, "I have examined every one of them carefully, and with four or five possible exceptions there is not a typhoid fever curve among them."

Gentlemen, you are requested to examine these charts, with this explanation, which ought to have been given to the Association in which they were so harshly criticised: There are amongst them three or four charts of cases in which absolutely pathognomonic symptoms were not present. They are there, because they appeared amongst well-marked cases of typhoid fever, were so diagnosed, and the presumption is that had they not been seen early and properly treated, they would have developed characteristic symptoms of the disease. Most of the others have a small figure in the upper left corner showing the number of physicians, most of them members of this Society, who examined the patients, confirmed my diagnosis, watched the treatment, and are ready to verify its results. Every one of them is the peer of the gentleman who criticised the charts, and quite as competent as he would have been, had he been present, to make an exact diagnosis in typhoid fever. And when he said: "Not all of the State of Ohio could convince me that they are typhoid fever charts or that the temperature of a typhoid fever patient could be brought to normal in so short a time," he simply exposed his ignorance of the possibilities of antiseptic medicine and placed himself on record on the wrong side of the question.

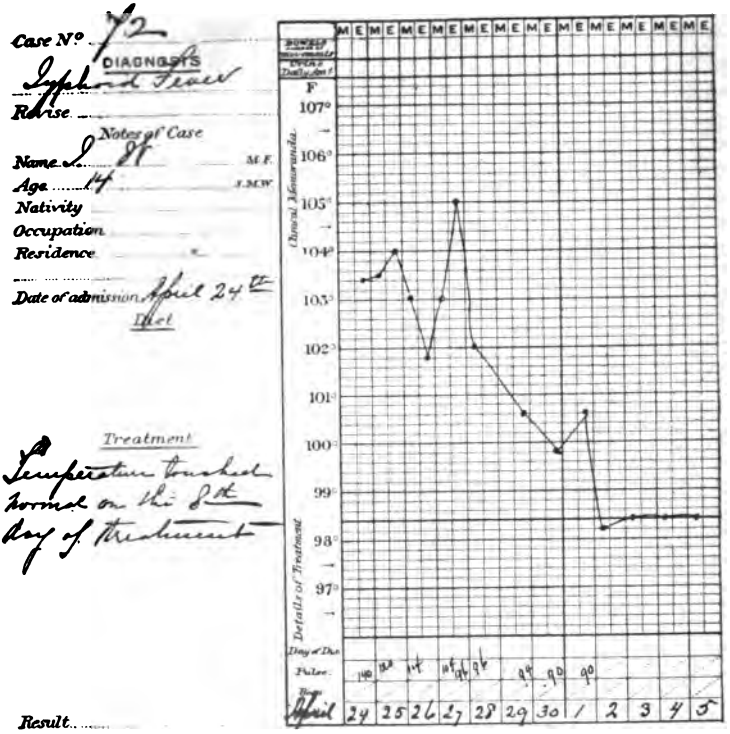
You are asked to examine them, and to accept them as

typhoid fever charts upon my diagnosis with the verification of these gentlemen; and to study the temperature curve as a typhoid fever curve modified by treatment. Had the curves pleased my critics they would have lacked much of pleasing me, and had I been unable to modify the curve, no possible reason would have existed for their presentation to or indeed for my appearance before this distinguished audience.

An analysis of these cases will show that many of them were put under treatment on the sixth, seventh or eighth day of sickness, and two or three on the tenth day or later, but a demonstration of the possibility of aborting typhoid fever as late as the eighth or tenth day of sickness must not be regarded as a claim that they can always be aborted at so late a date or as a justification of the dense ignorance, or criminal carelessness, or both, which are so often responsible for incorrect or inexact diagnosis. Nothing can justify the correction of a diagnosis from malarial fever or any other disease to typhoid fever, and still less the statement that any disease has run into typhoid fever.

In order to make a just estimate of the value of my results, you will please bear in mind that everything that the profession has regarded as essential to recovery from typhoid fever has been ignored. Very few of my private patients have had the advantage of trained nurses. No bathing has been ordered in ordinary cases, in any case, except one that I took on the sixteenth day of sickness. No restrictions as to exercise. My patients were allowed to sit up, walk about, and even go out of doors, if they felt able; many of them have eaten solid food on the seventh or eighth day, and I am fast coming to the conclusion that no restrictions whatever as to diet are necessary when patients are properly treated.

With my last paper, read April 25th, 1894, I presented my charts up to date, including that of Case No. 71, discharged on that day, since which I have had but two cases (the charts of which I hand you, Nos. 72 and 75) which de-



veloped absolutely pathognomonic symptoms of typhoid fever. They are the charts of the son and wife, respectively, of Mr. W. W., residing in the adjoining county of Trumbull, and of especial interest because I had Cases Nos. 73 and 74 (no charts), presenting tolerably well-marked symptoms of the disease, in the houses on two sides of his residence, and because he had previously lost a son and daughter from typhoid fever. Both of these cases presented all of the most characteristic symptoms of the disease: Intense headache, tympanitis, tenderness and gurgling in right iliac fossa, rose spots, bronchial catarrh, and in one nose-bleed and delirium. The charts show the result of

treatment, which consisted of a No. 5 capsule of the formula given in my second paper, minus the podophyllin, viz.:

℞ hydrarg. chlor. mite . . . . . 3 i.
guaiacol carb. . . . . 3 vi.
thymol . . . . . 3v.
menthol . . . . . 3i.
sacch. alb. . . . . ʒ ii.
eucalyptol as much as possible.

every half hour the first day, every fifteen minutes the second day, and every hour the third day, followed by

℞ eucalyptol . . . . . M. x.
guaiacol . . . . . M. ii.

every three hours, in one case one day and in the other case two days, when a No. 5 capsule of the first mixture was given every hour in one case, and in the other every fifteen minutes for one day, when the eucalyptol-guaiacol mixture was given until the temperature was normal. To Mrs. W., bowels having moved only once during her illness, a few doses of magnesia were given. To both were given a little ipecac, and Mrs. W. not having slept for four or five nights, her husband gave her a twenty-drop dose of tinc. of opium.

I regret that I am as yet unable to give any rule by which one may know when the desired object has been attained. I am in the habit of watching the symptoms very carefully, and when satisfied that they are steadily improving, diminish the doses or stop treatment, striving to make up by extreme watchfulness what I lack in knowledge.

There is no language strong enough to adequately condemn the habit of making a mixed diagnosis, as is ordinarily practiced in many localities or as laid down in some otherwise very good text-books. It is not at all uncommon for practitioners to say that their patient has malarial fever, a few days later correct that diagnosis to typho-malarial fever, and when the patient has had hemorrhage of the bowels, or is dying of exhaustion, to say that it has run into typhoid fever — a practice justly condemned by Dr. Gustavus Eliot, of New Haven; equally to be condemned is the custom of those physicians who await the development of one or more of the pathognomonic symptoms, as enlargement of the spleen, rose spots, etc., before venturing an opinion or beginning any proper treatment.

Since the course of treatment I have advised in typhoid fever is the best possible treatment for any disease for which it could be mistaken, and since a patient under this treatment need not go to bed, be restricted in diet, in social enjoyment, or even required to neglect his business, it is quite proper to treat every doubtful case as a case of typhoid fever. If future developments require a change in diagnosis and treat-

ment, the patient in any case will have profited by the mistake; and if the diagnosis prove to have been correct, his life will have been saved.

I have been very severely criticised by some very eminent authorities for claiming so much on so few cases, while, on the other hand, during the discussion of my paper in my local society one member said that he thought Dr. Woodbridge was responsible for a great many deaths for not having published a treatment capable of producing such results twelve years ago. To this I replied: "The gentleman will please remember that I gave my treatment to this society more than twelve years ago at a largely attended meeting at which the gentleman himself was present, and that every member who took part in the discussion condemned it." No! The responsibility for deaths must not be charged to me.

All of the great thinkers and teachers of the profession are, I believe, a unit, in teaching that typhoid fever cannot be aborted. They have a perfect right to their opinions, and so far as they are concerned they are probably correct.

Mr. President, I speak thus plainly because of the persistent efforts of two or three "captious critics" to embarrass my work, and because I wish to place the responsibility exactly where it belongs. I wish to say that I am ready at any time to go wherever, in the whole world, typhoid fever claims a victim, and if I have a death from the disease, challenge the publication of my failure, with the day of the disease at which I was called.

The importance of this subject cannot be overestimated. Should cholera or small-pox cause a few hundred deaths the people would be up in arms against its inefficient health boards; but Dr. Victor C. Vaughn, than whom there is probably no better authority, in an article published in the current issue of the *Pharmaceutical Era*, says: "About 50,000 people die annually in the United States from typhoid fever, and more than ten times this number are sick with this disease." He says further: "We have no foreign foe who could possibly inflict upon us the injury, suffering and death

probably no bad results have followed too free employment of these bactericides.

What we do not yet know about typhoid fever would make a large volume, I expect. The theory of the bacillus is a very interesting one, and it has not yet been carried out to its full conclusions, and it requires yet a great deal of study to determine the presence of the bacillus in all cases, its action, the poisons it produces, how these poisons are absorbed — and being in the chief absorbent tract of the body they should naturally be absorbed with great facility — and what effects they produce upon the nervous system. There is a great deal yet to be learned, but if we can stop the action of these poisons, if we can check them in their incipiency, we need not care what they do. If we see a weed and pull it up, that settles it; we do not need to know what the weed would do if allowed to go to maturity. As to the treatment itself, I have only one criticism to make. We have read some of "shot-gun" prescriptions. The remedy consists of eucalyptus, guaiacol, thymol, menthol, and calomel, all well known antiseptic remedies. Now, it would be interesting to me to know which of these does the business, or whether the entire combination is necessary. If the eucalyptus does it, then drop the rest of them; if it is the guaiacol, then we do not need to trouble the patient with the others; if the thymol is the drug, let us have the thymol, and so on. I would suggest to the doctor that he leave off one by one some of these oils, to see if the remaining prescription does as well as the whole. In conclusion, I am pleased to see something that offers a positive medication for typhoid fever, and something that, if the claims for it are founded on fact, will stop the progress of the disease in the first week.

DR. MURPHY.

Those two papers are well worth the consideration of any gentleman who has had any experience in endemic or epidemic attacks of typhoid fever. So remarkable are some of the statements, especially by our friend on the left, that I am challenged to make a few remarks. I was inclined to raise my eyes in surprise when the gentleman said he allowed his cases to walk about. What kind of cases does he allow to walk about? *When does he make the diagnosis?* With onset of the fever? In regard to the diagnosis of typhoid fever, the fever curve is not always characteristic. I have seen

just the opposite to the usual conditions of fever. The whole question, gentlemen, let me tell you plainly and candidly, is the question of the *diagnosis*, and Dr. Woodbridge's charts raise at once the query, is his diagnosis correct? In my day and generation the pathology of medicine has been upset twice and it is now going through its third change. All that is old is not false, and all that is new is not true. I would beg my friend to be a little guarded in saying that he has cured so many cases of typhoid fever with this treatment.

DR. HERRICK.

Where nutrition is normal there is no disease. The conditions of nutrition every one of you know. They are disturbed from without or from within. In typhoid fever you have a disease of Peyer's glands of the intestines in the ileo cæcal valve region. The infection which characterizes typhoid fever secondarily, comes from the infection incidental to the tumefied and thickened gland. They pass either by the veins or lymphatics; if through the veins, to the portal vessel, the liver and the lungs; if by the lymphatics, it is poured into the left subclavian vein. Can you tell me any other avenue of approach to the system? All the phenomena of typhoid fever can be traced from that point of infection. And now, I concur with my friend, in that if you treat the bowels as you treat a broken leg, the patient will get well. What do you do with a broken leg? You rest it. What do you do in typhoid fever? You rest the bowel, relieve it as far as possible of all duties, and clear it from all accumulations. If there is a plug which blocks up the circulation, get rid of it as easily as you can and then avoid its recurrence. Avoid all solid food. These papers emphasize one point very strongly. *We can treat typhoid fever.* I had a case a short time ago, a young child, with a temperature of 105,° abdomen tumefied, sore and tender, and some little delirium; I saw that I had a case of serious character on my hands. I made use of warm applications over the abdomen in the form of flaxseed poultices. Its grateful effect was expressed by the patient at once. Internal medication was also resorted to, and in the space of thirty-six hours the fever was in a measure abated; the temperature was reduced to 102.° I then gave castor-oil. There was a rather free catharsis. The fever never returned to over 102,° and the delirium, the sordes of the mouth and the dry tongue subsided.

DR. BEARDSLEY.

We are frequently called to see cases presenting all the symptoms of typhoid fever. We should flush the bowel. For this purpose calomel or podophyllin are valuable, but I am more in favor of one of the salts. Many supposed cases of typhoid fever recover under this treatmeut. I for one would not recommend the doctor's shot-gun treatment. I would give perhaps a small dose of something of antiseptic character. I believe in sweeping out the canal by cathartics and then prefer the sulpho-carbolate of zinc, and I push it until I get its effect upon the intestinal tract.

DR. SINNETT.

I am not accustomed to talking much, but the question of typhoid fever is one of great importance to me. I am not going to talk about the pathology or etiology much, but will only give a few facts which have occurred in my experience. When I was quite young in practice, I was connected with the Sanitarium, and we had typhoid fever in the community. Two of our nurses roomed in the same room with myself, and passed through typhoid fever. I gave the proper attention and nursed them, and I never gave more than twenty doses of medicine in six weeks. A man may not be able to follow that out in country practice. The same year I had, in the county infirmary, eighteen cases of typhoid fever, and they recovered under similar treatment. The idea of not giving milk in typhoid fever does not accord with my experience. One remedy I would always use in typhoid fever is alcohol and nitric acid combined. I use that considerably as a tonic and stimulant, but I always endeavor to give rest.

DR. CONE.

Being from Dr. Woodbridge's town and local society I wish to say that we have had several fights over this matter, and we have been watching Dr. Woodbridge for several years; but so far we have been unable to detect any failure on his part to make his pledges good, or that he has had a death from typhoid fever, and we intend to continue to watch him in the future, and if he ever has a death we will publish it.

DR. ROBERT PETER.

The only way to settle this question exactly is to try the

various methods. I believe by removing the contents of the bowel we give rest. If I have my arm full of wood, my arm is distended and the muscles get tired; if I throw the wood down, I can then rest. So in typhoid fever, the bowels are distended and the tissues on a stretch, and I can rest them by eliminating the substances which put them on the stretch.

DR. WOODBRIDGE.

The remarks of Dr. Murphy, eloquent and learned as they are, are not at all unique; I have heard them before; I have heard them for thirty years of my life; they simply repeat the old, old story, that typhoid fever is a thing you cannot treat. There may be extraneous causes which may bring about death, but, having proven beyond question, to my satisfaction at least, that the cause of the disease can be destroyed in one case, it follows that it can be cured in every case. As to the patient walking about, of which the doctor spoke. Some six or seven years since I was called to see a man in Girard. I found him to be a stationary engineer in the Girard Rolling Mill, and he said that he must go to the hospital. I told him that he could continue at his work. He had rose-colored spots, temperature 104.8°; he had typhoid fever, and I had no doubt as to my diagnosis. I was also called in consultation to see two sisters of this man. They died before morning and were buried in the same grave. In these charts, No. 22, you will see the fever record of this man's wife. The temperature was 105° and the pulse 120 when I was called. She was intensely tympanitic and was constipated. The physician in attendance, who treats more cases than any one of us, said that I did not want that case; he said she would die under any treatment. I said, maybe under his treatment but not under mine. On the third evening he told me to go and see her; he thought she would die that night. Her pulse was 140, and her temperature 105.° She made a good recovery. As to the shot-gun prescription, I have confessed that I am ashamed of it. I have gotten this by adding one thing to another, and I am too much of a coward to eliminate any of them. I do not say that every case can be cured taken on the sixth to tenth day, but if you recognize it at the earliest time and treat it as typhoid fever, you will have treated every disease that can be possibly mistaken for typhoid fever in the best possible manner, and will save every case of typhoid fever.

SYPHILITIC SPINAL PARALYSIS.

C. J. ALDRICH, M. D., CLEVELAND.

That syphilis is an etiological factor in cord disease has long been recognized; but the belief that it has a type peculiar to itself has not been generally accepted until Erb in the *Neurologisches Centralblatt* for March 15, 1892, sought by citation of a number of cases of syphilitic cord disease to establish "a type," which he designated "syphilitic spinal paralysis."

Since Erb's short article appeared, quite a large number of cases have been reported, which leads to the opinion expressed by Munchin of Chrakow, that it is not as rare as Erb infers.

Analysis of these cases and personal experience leads me to believe as Sachs suggests, that Erb described but one type of syphilitic spinal cord disease; and notwithstanding his great clinical acumen and diagnostic skill, we must dissent from his opinion that it is *the type* which he has described and which is characterized by the following peculiarities:

1. The usual symptoms of spastic paraplegia. The peculiar gait, carriage and movements.
2. Marked exaggeration of the deep reflexes.
3. Muscular contractures slight as compared with the exaggeration of the reflexes.
4. Involvement of the bladder.
5. A slight, yet distinct, disturbance of sensation.
6. Gradual onset of the disease.
7. A decided tendency to improvement.

This important clinical question has been taken up by

Sachs in a very able article read before the New York Neurological Society, April, 1892, in which he states his belief that there are broader points of diagnosis to be considered before labeling the *one* type which Erb describes as "syphilitic spinal paralysis;" and sums up the diagnostic points which to his mind are more constantly associated with specific cord disease, as follows:

1. The most striking of all is the unusual distribution of the disease over the greater portion of the cord, involving in some cases the cervical, dorsal and the lumbar enlargements.

2. The relatively slight intensity of the morbid process as compared with the extensive area involved, as evidenced by the preservation of some of the functions of the cord with complete loss of others.

3. A rapid dwindling of some of the symptoms and the chronic persistence of others.

4. The very frequent history of other symptoms pointing to specific disease in the same or other parts of the central nervous system.

To be able to diagnose syphilitic disease of the spinal cord without admissions from the patient or discovery of other ravages of the disease, is an important acquisition to medical knowledge.

The mixing and interweaving of spinal symptoms, confusing and misleading as they appear to be, should only serve to arouse suspicion, and I confidently believe that if we bear in mind the researches of Rumpf, and the teaching of Erb and Sachs, that we will rarely fail to trace the fault to the ravages of that chameleon of pathology—syphilis.

I mention the names of these illustrious observers not because they are entitled to the honor of the discovery of this protean disease; for to no one man or to any three men can such an honor be ascribed in these days, when each one is well and quickly informed as to the work of his medical compeers. The elaboration or development of a symptom group and connecting the same with changes found on the

post-mortem table, is the composite work of many men's minds.

In specific disease of the spinal cord, Jackson, Seguin, Bramwell, Wood, Oppenheim, Gowers and many other clinicians have remarked the lack of completeness of the symptom group; the atypical aggregation of symptoms; the tendency to spasticity; the loss of co-ordination with increase of knee-jerk; tabetic types with the girdle pains of a myelitis; slow onset; inherent tendency to improvement, especially certain sets of symptoms; and aberrant forms of motor and sensory paresis.

To the great mind of Erb, however, was reserved the honor of grasping this mixture of atypical symptoms and grouping them in an order and form which will in future serve as a guide in the diagnosis of these perplexing disorders. Sachs's great work in multiple cerebro-spinal syphilis prepared him to modify and generalize the propositions of Erb—broaden them, so as to take in more of the mixed forms, which from Kuh's article it appears Erb clearly recognized, and to add the propositions which will broaden our ideas and "point with much greater force to the syphilitic nature of the cord disease."

To aid in the settlement of this clinical question, every observer should carefully record and publish all the cases of undoubted syphilis of the spinal cord which come under his observation. Without attempting a discussion of the diagnostic merits of these two classifications or symptom groups, I desire to tersely relate a few cases of unquestionable syphilitic cord disease observed in my private practice, and draw a few casual inferences from a study of their symptomatology. I have no autopsy to report, as all the cases here reported are alive and improving, hence I will say little of the pathology of the affection.

While detailing each case I shall take occasion to point out the reasons for the diagnosis, and call attention to any divergence from either of the symptom groups given above.

Case I.—Mr. S., aged 33, musician, good family history,

general appearance healthy. Acquired syphilis at 19. Has many evidences of its ravages. Five years later began to suffer from headache and dizziness. Soon after the right leg became weak and heavy; hearing of right ear was partially lost; and slight yet distinct disturbance of sensation in both lower limbs. The legs began to ache and grew weaker, and felt more heavy, until he was compelled to take to his bed. In a few weeks he was able to go about. Had painful contractions of the muscles, and feet were often jerked from the floor. Unable to walk far on account of the weakness of the legs. Spastic gait developed with slight involvement of the bladder. During this time there was much sexual excitement.

Without specific treatment he mended slowly for two years. On waking one morning, he found himself completely paralyzed below waist line. The paralysis of the abdominal muscles disappeared in a few days. Had no pain in the back or legs. Rectum and bladder completely paralyzed. Anæsthesia of both lower limbs. Girdle pains. Complete analgesia of both lower limbs. Had no fever at the time of the attack. No bed-sores. Was in bed fourteen months. Sexual power lost. First saw patient three years after the last seizure; deep reflexes very much exaggerated, with trepidation and clonus; a smart pinch of the skin of the leg will throw the extensors into active contractions. Some rigidity and contractures of the leg muscles, but not sufficient to interfere with the ready production of ankle-clonus. Walks with two canes. Marked spastic gait. No trophic changes. Muscles are feebly contracted by the faradic current. The analgesia has given way to a slight degree of hyperalgesia. The anæsthesia is barely perceptible. The bowel and bladder functions have been nearly regained. Can copulate but without emission of semen. Considerable gain in motor power has taken place, but it has been very slow.

In this case we have a complete picture of a syphilitic spinal paralysis complicated by an acute transverse myelitis, probably hæmorrhagic in origin. From the time of his first

symptom of nervous disease he received no specific treatment whatever. His physician was an ultra-Hahnemannite who did not even ask him as to venereal infection, and himself being over-sensitive on the subject, never told of his stigma. These facts are valuable, showing as they do the progress and prognosis without any medical treatment further than the harmless placebos of homœopathy. I am unable to report any improvement in the case, as it has not been under my treatment more than two months. I do not expect much gain, as the accession of the acute myelitis as a secondary complication takes it out of the class of cases which experience has taught us are very frequently curable.

Case II.—Mr. G. S., age 38. Acquired syphilis in 1880. Had well-marked secondaries. During the year 1889 was a little shaky on his legs and suffered some rheumatic pains in them. In 1888 was shipwrecked and exposed to cold and wet. Was in bed two weeks with pains in the legs. Had girdle pains. Was surprised when he got up to find that he was uncertain on his legs, lacked power to direct their movements. Had difficulty in urinating; was dizzy and had headache, and darting pains in the legs, which were slightly swollen. Involuntary jerking of the feet from the floor. Fell on the street several times because of these sudden muscular spasms which jerked his feet from beneath him. On two occasions lost consciousness, but had no convulsion. Could not feel his feet on the ground; feet and legs prickled and "felt asleep." Considerable fibrillation in the lower limbs, and slight general tremor. Could not walk far, as the legs were weak, felt heavy and clumsy. Continued in about this condition until 1890, when I saw him for the first time. Complained of fingers of both hands being clumsy, could not button buttons well, difficult to pick up small objects, like pins. He first noticed this loss of tactile sense while buttoning buttons which were out of sight, such as putting on his collar.

The onset of the sensory symptoms had been so gradual that I was not prepared from his statements to find the

widespread cutaneous anæsthesia, which existed less in degree, however, than extent. Bladder slightly involved. Slight anæsthesia of the rectum, which persists to this day. He will, without knowing it, pass small portions of feces, although he has an ordinarily tight sphincter. Knee-jerk excessive, ankle-clonus marked. Pupillary reflexes normal. All the deep reflexes exaggerated. No rigidity or contractures. Stands with knees slightly bent, feet spread apart and in a stooping posture. Can stand with eyes closed a short time, but soon begins to sway from side to side and would eventually fall were the eyes kept closed. Gait wabbly, with no certainty of tread. No spring to step. Legs feel stiff, heavy and clumsy. They tire easily. After walking has much pain in them of a dull aching character. In wheeling a hand-cart which he pushes, he walks with some confidence and fairly well, but if he lets go the handle, feels as if he were about to fall. Still has girdle pains, which are so bad as to prevent his riding on the street-cars. Says his insides all shake together while on the car. The motion makes him sick and dizzy. While riding grasps the seat and shuts his eyes, as it seems that it makes him more sure of not falling. The spastic gait is not so marked as in first case. This case has been under observation four and one-half years.

It is intensely interesting, and resembles in many particulars the cases described by Erb as typical syphilitic spinal paralysis. The atypical aggregation of spinal symptoms immediately suggested a specific cord disease, and I believe the diagnosis "disseminated syphilitic myelitis," which was written in my case-book four years ago, would have been justified had he not admitted leuitic infection, or presented any other tangible evidences of the disorder. The cases which Erb has described as typical syphilitic spinal paralysis, he believes occur in a comparatively short time after infection, yet it was seven years before the spinal symptoms appeared in this case. Also note the rather rapid onset, which is at variance with the observations of both Sachs

and Erb. This can be explained on the hypothesis that the exposure only aggravated the morbid processes which were already present in the cord; for, as it has been observed, that before the shipwreck he was a little shaky on his legs and had aching pains in them. It is also to be remarked that the ataxia is in excess of most such cases.

I desire to again call your attention to the interweaving of spinal symptoms which this case presents: (1) Apparent locomotor ataxia, associated with loss of power over rectum and bladder; no Argyll-Robertson pupil and a marked increase of the deep reflexes. (2) Has the pronounced girdle pains of a transverse myelitis, with no more sensory disturbances in the legs than in the arms. (3) Has many symptoms of primary spastic paraplegia, without the rigidity or contractures noted in this disease. Active and persistent antisyphilitic treatment has produced a marked change in his condition.

I will repeat here what I said when this case was before the Cuyahoga County Medical Society one year ago. His clumsy fingers have become sensitive and supple. The cutaneous anæsthesia has disappeared. Ataxia is no longer present. Ankle-clonus has disappered. The deep reflexes are still present, but his limbs are strong and supple. The bladder has recovered its functions, and he no longer suffers pain in his limbs, headache or dizziness. Can walk well, and is not easily tired; is a laundry agent with a large route, and is in and out of his wagon many times a day without more than ordinary tire and discomfort.

Case III.—Mrs. F., age 31. Good family history. Appears anæmic. One year before consulting me she noticed a slight weakness of her lower limbs, which slowly increased until she could scarcely walk a block. They ached and felt stiff and uncomfortable. At the same time an indescribable paræsthesia developed in the feet and legs, which was worse at night and at times was so bad as to prevent sleep. Three months later paræsthesia, numbness and weakness began to develop in the right arm and hand. Could not hold a needle

while sewing. The left member soon shared a like fate. Both felt so heavy, numb and powerless that she could not comb her hair. Bladder was slightly involved. Examination revealed excessive knee-jerks, ankle-clonus. Exaggeration of all the deep reflexes. A distinct loss of tactile sense over trunk and limbs; pain and temperature sense slightly lessened below a line on a level with the crests of the ilia. No loss of temperature sense in hands or arms. No atrophy, rigidity or contractures. No Argyll-Robertson symptom. Distinct ataxia and spastic gait. Does not feel the feet on the floor, or to use her words, "feels as if the floor was sinking." Has severe headaches, aching pains in back and limbs. A peculiar slowness of speech which has been remarked by all of her friends. Memory fair; active and intelligent in thought. All these changes were very gradual in their development. No hysterical stigmata. Careful examination and guarded questioning elicited no specific history, nevertheless I felt sure that syphilis was at the foundation of the disease. Active anti-syphilitic treatment was immediately inaugurated.

The Hutchinsonian teeth of her youngest child which I saw a few days later, eloquently commended the diagnosis. This child was six years old. Her anæmic condition was hard to overcome, but long and persistent treatment has confirmed the diagnosis. At the end of a year's treatment, she walks well, has gained twenty pounds in weight, and is free from pain. Ataxia and paræsthesia are gone. Anæsthesia still persists, but in a comparatively slight degree. The bladder has not entirely recovered but is improving. Exaggerated reflexes still persist, except ankle clonus, which cannot be elicited.

After six months' treatment her husband acknowledged infecting her with syphilis two years previous to the birth of the last child. With the aid of his physician, he had been able to keep her in ignorance of the nature of the slight primary and secondary manifestations.

There are three things to which I desire to call your at-

tention: (1) The predominance of the spastic element without contractures. (2) The rapid disappearance of the paresis and paræsthesia, with the chronic persistence of the anæsthesia and bladder symptoms, confirms the third proposition of Sachs in a striking manner. (3) The wide distribution and general lack of severity of the symptoms also confirms the wisdom of his first proposition.

Case IV.—W. B., merchant, age 42. Three months before consulting me, noticed a progressive weakness of the legs, with alteration of gait. Aching pains in the back, worse in the legs. Slight yet distinct alteration of the bladder function. Acknowledges syphilis. Infected two years ago. Had severe cutaneous lesions, which have left their marks. Evidently received intelligent treatment for at least one year. Cannot rise from his chair without the aid of his arms, because of the loss of power in his legs. Walks with the aid of two canes. Gait markedly spastic and difficult. No rigidity or contractures. Ankle-clonus. Exaggeration of all deep reflexes. No cincture sensations. Slight anæsthesia of the feet, legs and lower half of thighs. No ataxia. No dizziness or headaches. Pupil reflexes normal.

The gradual onset, without history of injury or exposure, exaggeration of deep reflexes and spastic contractions, without contractures; slight loss of sensation and bladder power, makes this case a prototype of the Rumpf-Erb disease, which Erb believes to be the type of syphilitic spinal paralysis. Under five months' anti-syphilitic treatment, the spastic condition has improved to such extent as to enable him to discard the canes. The ankle-clonus is present but in a much less degree. The deep reflexes are still exaggerated, but sensible diminution is noted in all. Anæsthesia can no longer be detected. Aching pains in the limbs and back gone, but the bladder trouble has slightly increased.

THE SYMPTOMATOLOGY OF HEREDITARY SYPHILIS.

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The term hereditary syphilis is exact in its meaning, and refers to those cases in which the child is infected *in utero* by one or both parents. Infantile syphilis may refer to the congenital or acquired form. The latter in the child runs about the same course as in the adult. Syphilis is transmitted as syphilis, although the cachexia following may predispose the child to phthisis, scrofulosis or rachitis, just as any adynamic disease may do. To what extent hereditary syphilis gives immunity from the acquired form, can not be decided. The course of hereditary syphilis differs in some respects from the acquired form; the former, not being divided into stages, presents no initial lesions, followed by a period of incubation, after which the systemic symptoms appear.

The lesions of hereditary and acquired syphilis are often similar, being caused by the same poison, yet the lesions of hereditary syphilis may be similar to the products of perverted nutrition and occur in any adynamic disease. The lesions of hereditary syphilis are more hyperæmic and active than those of the acquired form, and involve larger surfaces; the earlier lesions being more distributed, symmetrical, than in the acquired form, which is developed later. The fœtus may be diseased at an early age of uterine life, die and soon be expelled; may be born prematurely, die soon, or be expelled dead. The child may be born at full term, presenting some of the lesions of hereditary syphilis, or as often oc-

curs, the child appears perfectly healthy at birth, but later on begins to exhibit evidences of syphilis.

The intensity of the inherited form varies in degree, according to the length of time which has elapsed since the date of original infection of parent or parents. Some children born with hereditary syphilis are plump and well-nourished, having a scant amount of hair, the nails brittle, stunted or malformed. These continue to thrive apparently for a few weeks or months, then gradually become delicate, anæmic, with a persistent loss of weight and plumpness. The digestive or intestinal disorders now present, seem unusually obstinate to ordinary remedies. The former healthy skin becomes a dingy hue, the underlying fat disappears, which allows the skin to hang loose in wrinkles on the arms, legs and abdomen, giving many wrinkles and creases where formerly there was plumpness. The fat baby face changes to that of the other extreme of life, the skin stretched across the cheek-bones, thin lips, prominent eyes, fretful expression, giving the senile countenance so characteristic of hereditary infection.

When syphilitic children are born apparently healthy, the usual symptoms will be noticed within three months; when the lesions appear later than the fourth or fifth month, they are doubtful evidences of inherited infection, as the child may then have acquired syphilis, infected during delivery or by nursing.

Children born infected may show atrophy of external organs or general atrophy and lack of development. Sometimes signs of arachnitis or general hydrocephalus may be present; the keel-shaped forehead yields to specific treatment very much, unlike non specific hydrocephalus.

Very common and characteristic symptoms of hereditary syphilis are the fissures of the lips. When these lesions are present, they are usually on the upper lip, symmetrical on either side of the center; if on the under lip, they occur in the middle, the scars of which may remain many years. Very characteristic are the wrinkles radiating from the

angles of the mouth, a brownish discoloration of the skin covering the prominent surfaces of the face, while the canthus or lower lip is lighter by contrast.

One of the earliest symptoms is the coryza, accompanied by the characteristic "snuffles;" the discharge from the nose, which is at first thin, later on becomes thicker, incrusted, blocking up the nasal passages. When this occurs, nursing is interfered with, thus aiding the already begun malnutrition; if this condition of the nasal passages is not cured, the mucous membrane, as also the Schneiderian, may ulcerate, the nasal bones become carious, come away accompanied by offensive discharges. When this condition is present, the child will nurse for a moment, then let go the nipple to breathe, doing so rapidly, with a fretful cry, moan or hoarse breathing, as aphonia may sometimes occur. While the same symptoms of breathing might occur in a child with an acute cold, yet the pinched face, fetid discharges from the nose, wrinkled skin and malnutrition, the characteristic breathing associated with other lesions, give evidence of inherited infection. When this condition is present in the nasal cavity, mucous patches appear in the mouth, throat or on other mucous surfaces; the epithelium on the palmar and plantar surfaces may take on a shiny, glistening appearance.

About the time the coryza becomes established, if not presenting before this period, the skin lesions usually appear, presenting the same condition of polymorphism as in acquired infantile or adult syphilis. In infantile as well as adult syphilis, the eruptions occur in crops; in the inherited form the eruptions are less symmetrical and apt to be confined to certain portions of the body, the general course being subacute. The circulation and cell growth being more active in the child than adult, the eruptions develop more rapidly, occupy greater area, are less firm and solid, than in adult syphilis. The principal eruptions of hereditary syphilis are the erythematous, papular, vesicular, pustular, bul-

lous and tubercular syphilides; often furuncular exudations exist with other lesions.

The erythematous syphilide is the most frequent and earliest hereditary exudation, appearing about the third week, often accompanied or preceded by the coryza and "snuffles." Usually this syphilide begins on the lower part of the abdomen as round pinkish spots, disappearing on pressure, which eruption soon extends over the face, chest and extremities, being fully developed in about eight days. The spots may now be nearly one-half inch in diameter, dull red, raw ham or coppery color, do not disappear on pressure, not usually elevated, desquamation not frequent, if present may be seen at the edges of large patches, resembling psoriasis. In the intense infection, the spots may coalesce, form fissures, which cause pain upon being handled or irritated by the normal discharges of the body. These spots are clustered in irregular patches upon the chin, at the angles of the mouth, breast, in the folds of the neck, or in the gluteal regions where the secretions and clothing rub the parts. Other lesions may occur by irritation in different parts of the body. When the color of these spots changes from a pinkish to a raw ham color, it is an important symptom. In some cases the eruption may be so faint that it may pass unnoticed, or the circular form of patches, so pronounced in acquired syphilis, may not be noticed in the earlier, but in the later exudates of the inherited form.

Sometimes the entire body may be covered with bright red, large flat papules or macules, which, when present on the gluteal regions, become moistened by the secretions, or irritated by clothing, become moist papules, often resulting in ulceration of the skin. When such ulcerations occur, mucous patches will be abundant in the mouth and throat, giving evidence of intense infection as well as a poor state of nutrition.

The papular syphilide usually appears as small and large papules, scattered in symmetrical forms over the body; at first bright red in color, then take on a coppery hue, coa-

lesce, form fissures or ulcerations. This condition being chronic, often obstinate to treatment, may appear with any lesion of inherited syphilis, while the uncomplicated papule responds promptly to treatment.

The condylomata later are a modification of the papular syphilide, occurring wherever there is moisture, as between the folds of the skin, or at a junction with mucous surfaces. The condylomata vary in size, usually gray pink in color, flat, sometimes ulcerated or fissured, from which an offensive discharge exudates, forms crusts, leaving a raw bleeding surface underneath. The condylomata are most frequently seen about the anus or vulva, are among the earliest and obstinate eruptions of hereditary syphilis, yielding more to local than systemic medication. When present at the angles of the mouth, accompanied by mucous patches in the mouth or throat, is a very important symptom. These exudations are aggravated by lack of cleanliness, with proper medication grow smaller, leaving only a copper-colored stain of short duration.

The vesicular syphilide is not as common as the others mentioned, occurs among the earlier symptoms, especially in those cases of intense infection. This syphilide usually appears on the chin, nates, forearms, abdomen or thighs in groups of irregular patches, which may be accompanied by a bullous or pustular exudation. This eruption usually remains isolated, does not coalesce, is slightly elevated above the normal skin, situated upon a deep infiltrated brown red base, containing a transparent fluid. At a time when the vesicular syphilide is present, some patches may be almost healed, while others are just forming, or patches of scales may mark former patches undergoing desquamation.

The pustular syphilide is an evidence of intense infection, usually appearing before the eighth week, sometimes present on children whose general condition is good. The entire body may be covered, but the general regions most visited by this syphilide are the thighs, nates and face, where the

eruption is slightly elevated above the surrounding skin, the base of a deep red color plainly showing the exact area it occupies. Several patches may occur on the face, or the entire face and scalp be affected, giving but little discomfort, remaining intact for several days, then rupture, after which the ulcerated surface may crust over. Large patches may form on the palmar or plantar surfaces or about the nails, which may be destroyed later on by the syphilide. The pustular syphilide may be seen without the vesicular, may leave no permanent disfigurement, while extensive loss of tissue or scars are lessened by nature, as the child goes on to maturity.

The bullous syphilide, like the pustular, is an evidence of intense hereditary infection, as well as often a forerunner of death. When children are born with papular, pustular, or bullous syphilides present, they usually die early, lacking in vitality and nutrition. If the child is born without the bullous syphilide, it may appear in four to seven weeks after birth, associated with other syphilides, just as in adult syphilis. The palmar and plantar surfaces, with the lower extremities, are usually most affected, while the body is generally spared, or only here and there bullæ are present. These syphilides may exist with any of the others mentioned, but, unlike the other bullæ of children, are rapidly developed. The bullous syphilide may be round, flat, conical shaped, the contents soon becoming sero-purulent, then purulent. While the development of these bullæ are rapid, their general course after being evacuated is about the same as the pustular syphilide. The bullous syphilide presents a distinct feature, differing from all other exudations, in that it rarely or never relapses. The cavity becomes shallow or deep, crusts form over it, if the patient recovers. In those cases in which the bullæ rapidly flatten or collapse, it is usually a premonitory symptom of death.

The tubercular syphilide is more rare in hereditary than in acquired syphilis, sometimes appears as early as the sixth month, or the second eruption of this syphilide may appear

several years after birth. The tubercular syphilide appears first as a deep-seated papule, or small movable nodule, the surrounding skin at the base of the elevation being infiltrated. Soon the surrounding skin becomes involved, a well-marked tumor from one-half to one inch in diameter results, which either may disappear or gradually soften down to an ulcer, running a protracted course, often very obstinate to local or systemic medication. The largest tubercles are found where the connective tissue is abundant and loose, their scaly surfaces often resembling psoriasis. The general color of this syphilide being a coppery hue, it differs from similar exudations often occurring in scrofulous children, the latter exudation being surrounded by greater hyperæmia and of a bluish tinge of color.

The furuncular syphilide may appear as early as the sixth month, or in crops as late as the third year, which sometimes may be the only symptom of hereditary syphilis, or it may appear with other lesions. The furuncular syphilides are usually multiple and symmetrical in arrangement, but if only a few appear, will be seen in irregular arrangement, which differs in some respects from ordinary furuncles. The furuncle begins as a small nodule with a low grade of inflammation, increasing to about the size of a small hickory-nut, the furuncle situated upon a well-defined base of a coppery red color. Soon the uppermost part of the furuncle becomes covered with ulceration, superficial at first, but soon extends downwards into the body of the furuncle. Sloughing soon occurs, leaving a deep irregular cavity with unhealthy walls, the edges discolored and usually are everted. The secretion from these furuncles is slight, of a very disagreeable odor, causing the furuncle to remain in same condition for weeks. If left untreated may increase in size, becoming more unhealthy. The duration of this exudation is uncertain, varying from one to several months, healing very slowly, often leaving permanent scars, which kind nature can but little repair or obliterate.

Some of the later symptoms of hereditary syphilis may

be seen in children whose general condition may have been fair in the earlier months of life, yet later on give evidences of inherited syphilis. Many of these cases present changes of the hair, teeth, cartilages or joints, with or without cicatrices of former exudations. The nose may be retracted, or the end flat from loss of cartilage, the base broadened from proliferation of the periosteum of the nasal bones during the coryza, or destruction of the nasal membranes. Even the bridge of the nose may be flattened by the loss of the nasal bones by caries. Bone swellings may be found on the shaft or ends of the long bones, deformities of joints resulting from syphilitic arthritis. Often in hereditary syphilis, bone deformities occur early in the disease, as gummy periostitis or ostitis, affecting usually the posterior surfaces of the phalanges or nearest phalanx. This condition is known as dactylitis syphilitica, which, if not cured, runs about the same course as other bone lesions.

One of the later symptoms of hereditary syphilis is the gummy infiltration and rapid destruction of the soft palate, which may leave a gap resembling superficially a cleft palate. The cicatrices on the skin, often so faint or slightly marked, in the fine lines at the angles of the mouth, about the nose, in the lumbo-gluteal or posterior crural regions, are the result of moist papules in early life.

The teeth give special and characteristic appearances in hereditary syphilis, which when present give strongest evidence of infection, even although all other symptoms are wanting or obliterated. The teeth may be dwarfed, undeveloped, decay earlier than usual; the second dentition is the one most affected, because the teeth suffer lack of development and nutrition. The upper central incisors are dwarfed, being both narrow and short, atrophy occurring in the middle lobe, which leaves a single broad, vertical notch in the edge of the tooth. A furrow often passes upwards on the anterior and posterior surfaces from the notch to the gum, which notching is usually symmetrical, but may be present only in one incisor. Sometimes the teeth diverge or

slant towards one another, being called the "screw driver" teeth. Not all of these furrows or lesions of the teeth are pathognomonic of hereditary syphilis, as often they are absent, but when existing with other symptoms are very strong evidences of inherited infection. Irregular arrangement and implanting of the teeth, with wide spaces between them, is often seen in hereditary syphilis, existing with deafness from purulent otitis occurring in earlier life.

When other existing symptoms corroborate, an ashen gray appearance of the gums, not adhering closely to the teeth, the tongue slightly thickened with irregular but faint notching at the sides, are diagnostic of hereditary infection.

Among the earlier symptoms, sometimes also may be noticed occurring later on, is the wakefulness of the child at night, probably due to periostitic pains. When a child is quiet during the day, wakeful at night, or if it sleeps a short time, wakes up with a cry, hereditary infection may be suspicioned, if no other symptoms are present.

Glandular enlargements are not as characteristic of hereditary syphilis as of acquired infection, whether infantile or adult. Enlargement of the glands is infrequent in very young children born infected, but may be found when searched for in children about the third or fourth month.

Alopecia occurs in hereditary as well as acquired infantile or adult syphilis. This alopecia may occur from scalp lesions. or from the adynamic effect of the inherited infection, varying as it does in intensity, as in adult syphilis. If a child of three to four months continues to have no eyebrows or eyelashes, or has had them but gradually the hairs were lost, in absence of other symptoms should be considered suspicious, and the child be watched for later developments.

Syphilitic onychia is more frequent in hereditary than acquired infantile or adult syphilis; sometimes this lesion only appears late in the hereditary infection.

Hæmorrhagica neonatorum from inherited syphilis, a more rare lesion, does not present any peculiar skin mani-

testations from those of the ordinary purpura hæmorrhagica. In many cases, umbilical hæmorrhage of the first month is due to this lesion of inherited syphilis.

Splenic enlargment from inherited syphilis occurs in fully one-half of the cases. The degree of enlargement is governed by the intensity of the infection ; those having great enlargement of the spleen are especially prone to die.

Interstitial keratitis or iritis are not uncommon sequelæ, leaving permanent traces, or a milky cloudiness involving the cornea, which may almost disappear with proper treatment. Yet generally a slight haze may be seen in the substance of the cornea, without any lesions or scars on the surface.

The symptoms of hereditary syphilis as it affects the organs of voice, respiration, brain, nervous system, blood, serous membranes, the viscera, are separate subjects, inviting a large field for study and investigation.

CROUPOUS PNEUMONIA.

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In presenting the subject of pneumonia for your consideration it is not my intention to give you an exhaustive paper. This is far from my purpose; but to keep in line with the key-note of our President, "short papers and to the point," I shall try and present the subject in as brief and practical a manner as I may be able.

Our pneumonia season is now drawing to a close with more than the usual number of cases throughout our latitude, if I mistake not, and with the usual mortality, so that a discussion of the subject is opportune. The discussion of pneumonia, under any circumstances, is of interest to the general practitioner, but more so when we have so large a number of medical men with us whom we may hear from on this important subject, so that an occasion like the present gives it additional interest, when are congregated those physicians from different localities, fresh from their respective fields of work, prepared to discuss the subject from its most practical standpoint, and by an interchange of views and a comparison of notes, profit may result to us all, and more especially to our younger brethren.

No age of life is exempt from pneumonia. The disease is most dangerous in the very young and in those after middle life. The octogenarian, eight times out of ten, falls a victim to its stroke. The hard-worked professional men are often its victims. Many of our noted medical men have been taken from us by this dangerous affection in the last decade. Persons in the upper walks of life are no safer

than those who are exposed to the vicissitudes of weather, showing that back of this a hidden cause exists.

Pneumonia has been a subject of much controversy with physicians in the last ten or fifteen years, owing to the change of treatment proposed and practiced by Dr. Hughes Bennett of Edinburg, who discarded the so-called spoliative treatment of blood-letting, calomel and antimony, and adopted an opposite course, a stimulating plan of brandy, quinine and liberal diet throughout the disease, and claimed far better results than he had hitherto obtained under the old system. This radical change of Prof. Bennett had the effect of provoking an acrimonious discussion throughout the medical world, but more especially amongst American physicians, and good has doubtless resulted from this controversy; but the lancet had to go to the wall, and a more rational plan, a safer course, a golden mean, now holds sway.

With these preliminary remarks we shall limit what we may have to say to but one form of the disease, the croupous pneumonia. It takes the name croupous from the character of the exudation that attends the inflammation, being the same material poured out in true croup, which coagulates and becomes solid in the course of the disease and which is fibrinous in its nature, hence the "fibrinous pneumonia" of the French authors.

Croupous pneumonia is divided into three stages: The first stage of engorgement, the second of red hepatization, and the third of gray hepatization. The inflammation is confined to the parenchyma, or substance of the lungs which is composed of the air cells, extremities of the bronchi, some connective tissue, blood vessels and nerves. The inflammation seems to attack by preference the lower lobe of the right or left lung; the right lower lobe is the one infected in a majority of cases. According to some observations given by Flint in his "Practice," of 124 cases cited the inflammation occupied the lower lobe of the right lung in 29 cases, and in 25 cases the lower lobe

of the left lung; in 27 cases the whole of the left lung was involved in 9 cases only; and in 8 of the 124 cases was the upper lobe of the right lung attacked, while in only 3 cases the left upper lobe was affected, showing that the upper lobes are rarely affected.

All our late authors consider croupous pneumonia as a self-limited disease, and its duration in general is from five to thirty days. In fourteen fatal cases given the shortest time of death was three days and the longest twenty days. The changes that take place in the lungs in an uncomplicated case of croupous pneumonia are, first, the hyperemia or congestion, which lasts from twenty-four to forty-eight hours, when solidification takes place or red hepatization. This condition, the second stage, lasts from two to four days; in some cases, however, it may last a much longer time, and is followed by commencing resolution or a softening down, and a liquefaction of the exudation. This stage is called gray hepatization, and lasts from three to four days, but occasionally occupies ten days. The air cells do not regain their normal condition under two or three weeks, so this gives a duration of about three weeks for a favorable case of croupous pneumonia, yet many cases recover in less time.

The chill ushering in an attack of the disease is more or less pronounced, and lasts from a half to several hours, and is followed by fever, headache, backache, pain in the chest, and a dry, hacking cough, which the patient tries to suppress. The chill is followed by fever, which increases so that at the end of the first day there is usually a temperature of 103° or 104°; sometimes 105° is reached, the pulse ranging from 100 to 116. The respirations are increased to thiry or forty in the minute, and occasionally may go up to fifty or sixty. The physical symptoms at first are slight dullness over the lung affected, with fine crepitation. The expectoration is a small portion of mucus streaked with blood, which after a day or two assumes the characteristic appearance, rusty and viscid.

When solidification takes place, the physical symptoms are changed. The dullness is more marked, and the crepitant rale is succeeded by the bronchial respiration. The breathing is more oppressed and painful. The face is flushed, with an anxious expression. The urine is high colored and scanty, containing a large amount of urea, and a notable circumstance in this disease is an entire absence of the chlorides in the urine, which is indicated by the nitrate of silver test.

All these symptoms continue with little abatement until the crisis is reached, which takes place generally between the fifth and tenth days, when the temperature falls to the normal. The crisis is attended with a profuse perspiration or an abundant secretion of urine. The expectoration is increased and is much less viscid, but still rusty in appearance. The pulse lessens in force and frequency. The tongue becomes moist and begins to clear off. The stage of resolution is now at hand. The patient's countenance brightens up, and his breathing is easier. The crepitant rale returns, and dullness on percussion is less marked. The chlorides return to the urine, which is an indication of a favorable termination of the case. The patient is now on the high road to recovery.

Albumen is spoken of as occasionally present in the urine in pneumonia, and is attributed to the systemic venous congestion or coexistent disease of the kidney.

While pneumonia prevails generally in the spring, yet it occurs at any season of the year. Our late authors treat it as a self-limited disease, an essential fever, and this point has been most thoroughly investigated by pathologists and clinicians, who have come to the conclusion that it runs a definite course, and the natural history of the disease accords with this view. Everything connected with it points to a constitutional origin, and the inflammation of the lungs is a manifestation of that fact.

While pneumonia has been thought for a long time by advanced minds to be of specific origin, and the *materies morbi*

of an organic nature, the time had not yet arrived to demonstrate the fact; but since new light has been shed upon etiology by the discovery of the germ theory, it has been conclusively proven that the disease is produced by a specific germ, the *pneumococcus of Friedlander* as the cause. In support of a specific origin is the occasional outbreaks of epidemics of the disease confined to certain localities, and under certain conditions may become infectious. In proof of this, your writer reported a circumscribed epidemic of infectious pneumonia to the Hildreth District Medical Society of this city a few years since. The local outbreak occurred amongst some gardeners, who were all related; the disease was confined to four families, in which there were fourteen cases, all recovering in from two to three weeks, showing an infectious nature. Again, on this point is the sudden appearance of the disease in prisons and infirmaries, spreading through the wards without apparent exposure to cold; also the occurrence of several cases in the same family, undoubtedly showing its infectious nature under certain circumstances.

On this point again, Kuchen, a German investigator, inoculated a number of animals with the sputa of pneumonia with the following results: Two rabbits died in collapse in two days, while in six fever followed the inoculation, and presented oscillations. At the end of the fifth, sixth and tenth days, diarrhœa and prostration accompanied the fever. The animals between the sixth and tenth days showed pleurisy and hepatization of the lungs, lobar and lobular. Five of the cases recovered. These facts confirm a specific cause. Some writers have advocated two forms of croupous pneumonia, one due to cold, the other to a *materies morbi*, and such instances as the foregoing facts might be multiplied did the limits of our paper admit of it. The physicians of the future will treat pneumonia as an essential fever, with a local expression in the lungs, so "lung fever" is not altogether a misnomer.

The treatment of pneumonia has been one of the vexed

questions with the profession for the last fifteen years, and this point still remains unsettled. The use of the lancet is the bone of contention ever since Hughes Bennett published his experience and opinions against the use of blood-letting and the antiphlogistic treatment generally, supporting his arguments by a large number of successful cases treated by the opposite plan, without the lancet, without calomel, and without antimony. Since the publication of such experience the medical world has been drifting about on the sea of uncertainty, and pursuing a vacillating course in the treatment of pneumonia, with an increase of the mortality doubtless. The controversy on this point waged long and warm, and good has no doubt resulted finally from the discussion. The pendulum of professional opinion, which has oscillated much too far to the opposite, is returning, and a better treatment will be the outcome, a treatment which sanctions the use of the lancet in certain cases.

As pneumonia is a self-limited disease, a very perturbating course of treatment is uncalled for in the first and second stages, and may do harm by exhausting the patient and rendering him less able to withstand the crisis, which is always attended with a depressed heart. Some writers maintain that pneumonia can be aborted. This may be attempted, if the patient is seen early enough, say within the first six or twelve hours. This may be done by giving an emetic, and following this by a dose of calomel and Rochelle salts; after this acts, give twenty grains of quinine with an eighth or a quarter of a grain of morphine by hypodermic injection. Should this arrest the fever, nothing more should be done beyond keeping the patient confined to bed until convalescence occurs. Should the abortive treatment fail, it is claimed that the disease will be so modified by it as to require no further treatment than a mild course of suitable remedies.

The general principles that should guide us in the management of a typical case of croupous pneumonia, as we now look upon it as a self-limited, essential fever, with a

local expression involving the lung, the case running a definite course and terminating in from seven to twelve days by a crisis, is a supporting plan, which we think the safer, unless there are positive indications for an opposite course. Treat the patient rather than the disease. We should be governed in the use of remedies by the symptoms. In the chill, bring on reaction by the application of dry warmth to the extremities and hot drinks; after reaction takes place, the pulse will run to a hundred beats, while the temperature will range between two to four or five degrees. With a pulse of a hundred or a hundred and twelve, heart sedatives are hardly necessary. A mixture of spiritus mindererus and spirits of nitre may be given. A temperature of 102 to 103 degrees should not alarm us or cause us to give active antipyretics. These remedies are dangerous in the treatment of pneumonia. The only antipyretic that I think at all safe is either antikamnia or phenacetine. These will reduce temperature without weakening the heart. They will relieve nervous irritability also.

Should the case require heart sedatives, the best in our experience is a combination of digitalis and nux vomica. To this veratrum may be added, if thought necessary, but much care must be observed in the use of such agents—I mean those that depress the heart—especially at the time when the crisis is pending, for harm may be done by exhausting beyond recovery the already overburdened and weakened organ. We should give those remedies which sustain at this particular juncture, as the cause of death in pneumonia is from heart failure, or paralysis of the organ, caused by a rapid pulse and high temperature usually.

Where we have a robust constitution to deal with, and the case is attended with much pain in the lung and great difficulty of breathing, we should not hesitate to take from sixteen to twenty ounces of blood from the arm, or more if he is not relieved of his pain and difficult breathing. After this give him a hypodermic injection of a quarter grain of morphine, and follow up with a pill composed of calomel, quinine,

antikamnia, and ipecac, alternating with a saline mixture of bicarbonate of soda and chlorate of potash, for its solvent action on the secretions. In addition to this, a poultice of flaxseed and slippery elm well faced with mustard should cover the whole of the affected lung, and this should be held in place by a bandage of muslin and cotton batting to hold the chest in a splint, as it were, which gives comfort in breathing.

Amongst the remedies used in the treatment of pneumonia, I know of none so efficient as the ammonia preparations. The muriate and carbonate are valuable in certain stages of the disease, and in cases having a typhoid tendency ten or fifteen grains of carbonate or the muriate ammonia come greatly to our aid. In all cases of threatening heart failure, these agents with rye whisky are the *sine qua non* of treatment.

The approach of the crisis is indicated by a fall in temperature and the pulse-rate. At this stage a more supporting and stimulating course is called for. The weakened heart is best sustained by a combination of tincture of digitalis and tincture nux vomica; twenty drops of the preparation should be given every three or four hours, alternated with the carbonate and muriate ammonia, which favors expectoration and clears up the lungs. Should there be much pain in the chest after the fever subsides, it may be removed by a blister over the affected lobe. A nourishing diet, such as milk and beef tea, and quinine, should be given until convalescence takes place.

Should the question of the use of the lancet come up in the commencement of the treatment of a case of pneumonia, its use should be confined to those cases such as I have indicated. It may, however, be occasionally employed with advantage, even in the milder forms of the disease. On this point an old and eminent author and practitioner has said, that "no disease bears the loss of blood better than open, well-developed pneumonia." This word is from the pen of Prof. Geo. B. Wood, deceased, the author of Wood's Practice.

Though the elder Gross has placed blood-letting with the lost arts, it is being resurrected, however, and is gradually taking its place upon a more enlightened plane of therapeutic science. By recurring to the experience and teaching of our forefathers, who wielded those heroic agents with such wonderful success in the treatment of inflammatory affections, the present generation of physicians would be instructed in the use of this remedial agent which is with us again and to remain.

Bacteriology is making progress in regard to the specific germ concerned in the causation of pneumonia. It has been demonstrated that cultures of the pneumococcus lose their virulence about the seventh day; it is also at this date that a rapid decline of the symptoms takes place in the disease. The so-called "crisis" of pneumonia corresponds with the loss of the pathogenic properties of the germ. The pneumococcus does not die, however, at the critical period of the disease, but only temporarily loses its virulence, reacquiring its activity at the end of fifteeen days.

THE PHENOMENA OF FERTILIZATION, AND THEIR BEARING ON HEREDITY.

J. PLAYFAIR MCMURRICH,

Professor of Biology, University of Cincinnati.

It was with considerable diffidence that I accepted an invitation to address this Association upon some biological topic, realizing that my special studies possess but a remote bearing upon the facts and theories of medicine. When I considered, however, that modern biology owes its existence to a large extent to that desire for the solution of the problems which underlie all the phenomena of life, to the investigating spirit which has always characterized students of medicine, and when I recollected that notwithstanding the apparent divergence of the two sciences which has resulted from necessary specialization, the aim of both is the correct understanding of the phenomena of life, I felt assured that a brief statement of some of the fundamental facts which determine the course of modern biological speculation would not prove out of place on the present occasion.

No problem, perhaps, is exciting more interest and stimulating more investigation in the biological world at the present time than that of heredity, and there is no problem whose solution will have more far-reaching results. It has seemed, therefore, appropriate that I should attempt to present to you the lines of observation being followed by the biologists in connection with this problem, and that I should endeavor to outline some of the more important facts in connection with it that recent investigation has brought to light. The subject is a great one, and it would be impossi-

ble to present it to you on the present occasion in its entirety, and I therefore limit myself exclusively to the bearing of the facts of fertilization upon it.

It is probably hardly necessary for me to point out that the forces which govern inheritance must reside in the germ-cells. It is a fundamental principle of modern biology, that every living organism, at some period or other in its life history, is represented by a relatively small number of more or less unspecialized cells, and in those individuals which are not produced by non-sexual methods a single cell, the ovum or spermatozoon, at one time contains all the potentialties of the future organism. Most frequently, it is true, a fusion of two cells is necessary for full development, but numerous instances occur in which the ovum, without fertilization, is capable of developing into an adult organism, so that the statement just made stands in no need of modification. It may be stated incidentally also, that there is evidence to show that under certain conditions the sperm-cell may also develop parthenogenetically and give rise to an embryo, though further experimentation is necessary in this direction before the conditions which govern this remarkable form of development are fully understood.

A careful study of the ovum and sperm-cell then seems to promise important results bearing upon heredity, and a continuation of the observations upon the forces which govern the fertilization and segmentation of the ovum is equally important. Within the last twenty years, and more especially within the last ten, remarkable advances have been made in our knowledge of these phenomena, mainly through the researches of Hertwig, van Beneden and Boveri, the first named showing in a series of papers, published in 1875, 1877 and 1878, that fertilization consisted essentially in the fusion of the nuclei of the spermatozoon and ovum. Before this process occurs, certain remarkable phenomena are manifested in the ovum, constituting what is usually termed its maturation. It is well known that in the division of cells peculiar modifications of the nucleus take place, its es-

sential constituent, the *chromatin*, aggregating to form loops or *chromosomes* of a definite number for all the cells of any particular species. These loops then divide longitudinally, so that twice the typical number is produced, half of them later passing towards one pole of the dividing cell and the other half to the other pole, the division plane separating the two groups so that each of the daughter cells possesses the typical number of chromosomes. During this process suitable reagents will bring into view a series of delicate fibrils which extend from the chromosomes, converging as they go, and thus forming a spindle-shaped structure, while from the points to which they converge at either end of the spindle other similar, though usually shorter, filaments radiate outward in all directions like the rays of a star, forming what are termed the asters. The significance of these achromatic filaments, as they are termed, of the spindle and asters does not concern us now, but special attention must be directed to a minute body occupying the centre of each aster which is termed the centrosome, and was first discovered, I believe, by Edward van Beneden in 1887.

In the ovum preparing for maturation we find in the place of the nucleus such an aggregate of asters, spindle and centrosomes as has just been described, the only but important difference being that the chromosomes, which we may assume for clearness are usually eight in number in the species which is presumably under examination, are doubled at their first appearance, so that they are sixteen in number. The division of the ovum results in the formation of a small cell and a big cell, the latter being still termed the ovum, while the former is the first polar globule, and each of these possesses eight, *i. e.*, the typical number of chromosomes (Fig. 1). In ordinary cell division the chromosomes after the completion of the division are diffused throughout the nucleus and apparently lose their identity, the typical number again aggregating before the next division. In the maturing ovum, however, the second division follows quickly upon the first, before any dispersion of the chromosomes

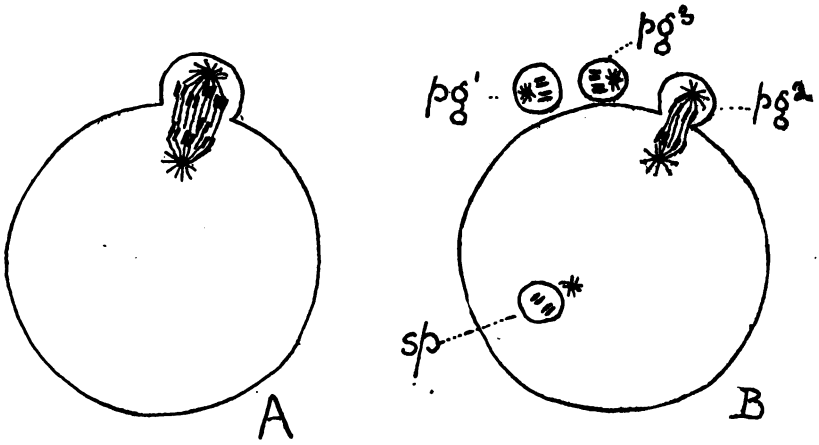

FIG. 1.

MATURATION OF THE OVUM.

A. Formation of the first polar globule.
B. Formation of the second polar globule and entrance of the spermatozoon.
pg^{1-3}—polar globules. *sp*—spermatozoon nucleus.

has taken place, so that on the formation of the second polar globule the number of chromosomes in the ovum is reduced to four, *i. e.*, to one-half the typical number, a similar number occurring in the second globule, while the first globule also frequently divides so that there result three small polar globule cells, each with four chromosomes, and the ovum with a similar number (Fig.1,B). The polar globules play no further part in development, but degenerate and disappear.

At the close of the first division a single centrosome remained in the ovum; before the second division this divided so that two centrosomes were present, one of which again remains in the matured ovum, which therefore contains a nucleus with half the typical number of chromosomes and a centrosome.

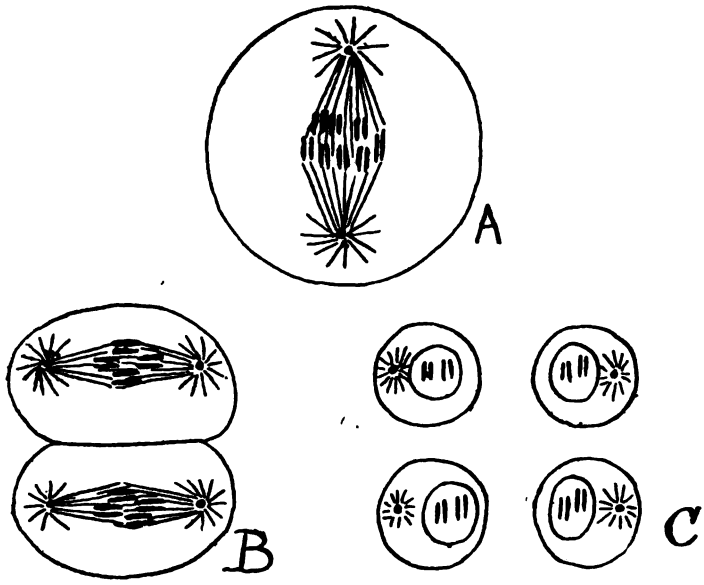

FIG. 2.

MATURATION OF THE SPERMATOZOA.

A. First division of sperm mother cell.
B. Second division.
C. Result of second division, each of the four cells so formed later becoming a spermatozoon.

We may now follow the process of formation of the sperm-cell, and it will be convenient to trace it in such a form as the Round-worm of the horse (*Ascaris megalocephala*), on account of the simplicity of the process in that form. The development starts from a cell comparable to the immature ovum. This cell divides, a doubling of the chromosomes occurring just as in the ovum (Fig. 2, A), the division accordingly resulting in the formation of two cells, each with the number of chromosomes typical for the species. Each of these two cells again divides (Fig. 2, B), the number of chromosomes in each of the four cells so produced (Fig. 2, C) being half

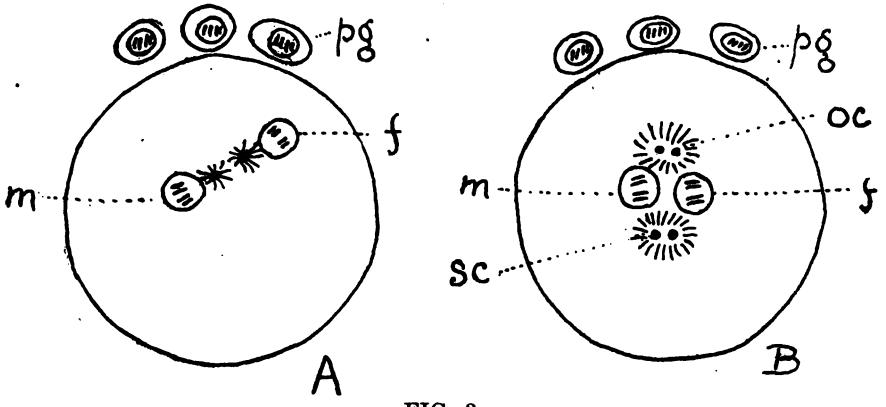

FIG. 3.

FERTILIZATION OF THE OVUM.

A. The male and female nuclei approaching each other.
B. The division of the centrosomes.
pg—polar globules. *m*—male nucleus.
f—female nucleus. *sc*—sperm centrosome.
oc—ovum centrosome.

the number typical for the species, and each of these cells becomes a spermatozoon.

The entire process of spermatogenesis is therefore comparable step by step with the maturation phenomena of the ovum. In each there is a doubling of the chromosome, followed by their reduction to half the typical number, the only difference being that in the case of the ovum three of the cells, the polar globules, play no part in the further development, and are to be considered abortive ova, while in spermatogenesis each cell becomes a spermatozoon.

Let me again emphasize the fact that in each of the mature germ-cells we have but half the number of chromosomes typical for the species, and since in the spermatozoon development the centrosome behaves just as has been described in the case of the ovum, we have also in addition to

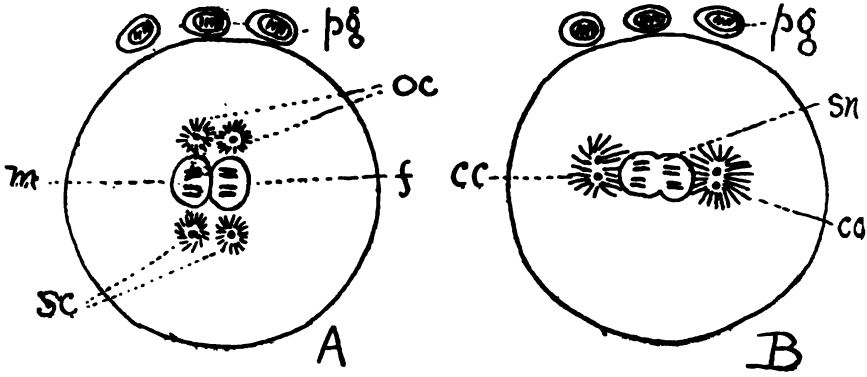

FIG. 4.

FERTILIZATION OF THE OVUM.

A. Beginning of the rotation of the centrosomes.
B. Completion of the rotation of the centrosomes and the formation of the first segmentation spindle.
Lettering as in Fig. 3, except, *sn*—segmentation nucleus, *cc*—compound centrosome.

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the nucleus in each germ-cell a centrosome. The phenomena of fertilization depends on the existence of these two sets of bodies, and I may now proceed to describe briefly their behavior.

Usually during the formation of the polar globules, though sometimes before and sometimes after their appearance, the penetration of the ovum by the spermatozoon takes place. When seen within the ovum the male cell appears as a supernumerary nucleus in close contact with which, on the side nearest the centre of the egg, is the sperm centrosome surrounded by its radiations (Fig. 1, B). After the formation of the second polar globule the ovum nucleus with its centrosome, which is also situated on the surface nearest the centre of the egg, returns from the periphery towards

the centre, in the neighborhood of which it meets with the sperm nucleus (Fig. 3, A). There is evidently an attractive force at work which draws the two nuclei together, and it may be pointed out that, inasmuch as the centrosomes precede the nuclei, it is possible that the force resides in these bodies. Having come into contact with one another, the two centrosomes separate somewhat, allowing the two nuclei to come into contact, and then there begins a peculiar series of phenomena in connection with the centrosomes, which has been termed the quadrille of the centres. The two centrosomes lie on opposite sides of the two nuclei, and each divides into two parts (Fig. 3, B); the two daughter centres of each centrosome then separate (Fig. 4, A), and rotate through an arc of 90,° coming thus to lie in pairs on opposite sides of the contiguous nuclei, each pair being composed of a male centre and a female centre (Fig. 4, B). Finally a fusion of the two individuals of each pair occurs, a more or less complete fusion of the two nuclei also supervenes, the chromosomes being thus restored to their original number, spindle fibres, arising in connection with the compound centrosomes, penetrate the compound nucleus. The first division of the ovum takes place in a plane which passes through the point of emergence of the polar globules, and the development of the embryo is thus inaugurated.

Such then are the facts of fertilization as revealed by the most recent investigations, and it remains now briefly to refer to their bearing upon the modern theories of heredity. The requirement demanded of any such theory is, to state it briefly, that it shall explain plausibly and in accordance with the facts the manner in which the structural peculiarities of the parents are transmitted through the germ-cells to the offspring. I say *structural* peculiarities advisedly, since the intimate relation between structure and function is an admitted fact, even the most complex of nervous phenomena being referable to structural peculiarities. The simplest explanation of the transmission is the assumption of the existence in the germ-cells of organic or morphologi-

cal molecules corresponding to the various variable parts of the parent organism, and such an assumption has been the basis of all the important theories which have been proposed within recent years. We find such molecules in Herbert Spencer's physiological units, in the pangens of Darwin and DeVries, in the plasomes of Wiesner, and in the biophores of Weismann, to mention only a few of the more important theories, the essential differences between the various views being the source of the molecules and the region of the germ-cell in which they are accumulated. According to the earlier theories, they were given off from the various parts of the body and migrated to the germ-cells in some manner or other, later on to be distributed to the proper regions of the embryo; while the later theories, of which Weismann's may be taken as an example, simplified the process by doing away with such a centripetal migration and assuming that the molecules exist in the ovum from the time of its first differentiation in the course of development and are later distributed to the proper regions of the embryo, the segmentation of the ovum being then a process of analysis and distribution, being a qualitative as well as a quantitative division.

The second essential difference concerns the region of the cell in which the molecules are stored up. Prior to the discovery of the part played by the nuclei in fertilization, the whole cell was given over to the molecules, but later they were supposed to be entirely concentrated in the chromatin of the nucleus, this substance being *the material bearer of heredity*. It is to this point especially that I wish to direct attention. It was a supposition quite in harmony with the facts of fertilization as they were known before the "bahnbrechende" discovery of Foe (recently confirmed by Conklin) as to the part played by the centrosomes. Their remarkable behavior which I have described cannot be without significance; in fact it seems clear that they are the structures which determine division and certainly the direction in which the division of the nucleus occurs. It is clear

then that the number of successive divisions which any cell undergoes depends upon the activity of the centrosomes, and, since the direction of the division is dependent on the same body, the form and to a certain extent the size of the resulting organism is dependent upon the centrosomes. These two qualities are certainly structural and are certainly heritable, and the conclusion necessarily follows that the centrosomes as well as the chromosomes are bearers of heredity.

The question now arises as to the origin of the centrosome. Does it belong to the cell-protoplasm or the chromatin? It would consume too much of your valuable time to discuss the conclusions of the various authors who have studied this question, some of whom have decided in favor of the chromatin and others for the cell-protoplasm, and I must simply state my own belief that it is to the latter source that the centrosome is to be traced. This is the conclusion of Watase, and is supported by such strong circumstantial evidence that I believe it is the view which must eventually prevail. If so, then it follows that the cell-protoplasm as well as the nuclear chromatin is an important factor in the transmission of hereditary peculiarities, a conclusion borne out by several facts, such as that observed in the fertilization of one sea-urchin's ovum by the sperm of another species, in which case the mode of segmentation is exclusively maternal and is not influenced by the male nucleus.

The importance of the chromatin must not, however, be under-estimated. Its reduction during maturation to half the proper amount and the restoration of the typical number of chromosomes during fertilization must have some significance, and it is a well-known fact that protoplasm without a nucleus speedily degenerates, whereas if a small fragment of nuclear matter be present, regeneration and not degeneration ensues. Both protoplasm and chromatin are accordingly necessary for heredity, at least in all animals reproducing sexually, and each plays its part in the transmission of inheritable peculiarities.

Such seems to be the status of our present knowledge as to this important question. There has still to be settled the question as to the existence of material particles which serve as the bearers of heredity. As stated, all the modern theories are based upon the existence of such molecules, but within the past three years a branch of biology termed experimental embryology has thrown not a little doubt upon the correctness of this assumption. Into the details of these observations I cannot enter now, but may simply state that they indicate that a cell which under normal conditions should give rise to, let us say, structures situated in the median line of the body, may under changed conditions come to lie in the right side and gives rise to organs belonging to that region of the body; and furthermore a cell which normally will give rise to one-quarter of the body may; under abnormal circumstances, give rise to an entire organism. It is difficult, to say the least, to reconcile these facts with the existence of material bearers of heredity. Indeed it seems more probable that, as it has been said, the character of a cell is a function of its location, that it is the mutual interaction of cells which determines their future characters and not the presence of any pre-existent molecules.

Modern investigations on this subject have proved to be iconoclastic. They have broken down assumptions previously existing but have given us little in their place. Heredity is a mystery to us at present, but the way has been cleared of obscuring theories and we may confidently look forward to a not far-distant solution of the problem. The entire cell and not its nucleus alone must be studied; its relations to other cells and the conditions which govern the differentiation of cells in the embryo, are the points to which special attention must be paid. It is to the embryologist, and especially to students of the embryology of the invertebrate animals, that we must look for the facts on which to base the theory, and when it comes it will undoubtedly stimulate scientific thought and investigation, both morphological and physiological, as no other biological deduction,

with the exception of Darwin's, has done. Its bearings on the science of medicine will be no less important. The formulation of the laws governing inheritance which will result will be of invaluable benefit to the physician as well as to the agriculturist and horticulturist. But in the meantime we must observe and experiment, laying up a store of facts, upon which a mind fitted for great generalizations may call, and marshaling them in their due array may march them forward to the capture of the citadel of heredity.

THE IMPORTANCE OF DETERMINING REFLEX IRRITATION IN THE TREATMENT OF CERTAIN CATARRHAL DISEASES.

JOHN P. SAWYER, M. D., CLEVELAND.

"That nature has a constant tendency to repair the injuries to which she has been subjected, whether those injuries be the result of fatigue or exhaustion, of inflammation or accident; also that this reparative power becomes at once most conspicuous when the disturbing cause has been removed," are statements made in this form by Hilton in his famous lectures, and are the general expression of truth, of importance alike to surgeon and to physician. It has often been noted that the sympathetic relations existing between the various mucous membranes of the body are so intimate that disordered conditions in the one induces disturbance in its fellows, and that relief of the first is usually followed by relief in the second. And this relation exists because of the connection between mucous membranes and the control of their functions exercised by the nervous system. The association between stomach and intestine is most intimate, and it should here be noted that the liver and pancreas as well as the kidneys are to be considered as extensions of mucous structures.

Through the portal circulation, as well as by nerve tracts affecting the regulation of the renal circulation, the kidneys are brought mechanically into close relation with hepatic disorders, primary and secondary, and this independently of the direct stimulating effect upon the renal secretion of

the effort to eliminate from the blood either abnormal constituents or excess of certain normal constituents.

The well-known digestive and urinary disorders of menstruation, a normal process, or of endometritis or ovaritis, abnormal conditions, need only be mentioned to call to mind the effectiveness of reflex irritants from the genital organs.

The relief of headaches, vertigo, and digestive disturbance, by stopping waste of nerve force through faulty accommodation in the eye in otherwise healthy individuals, is a lesson well learned. That the digestive apparatus often suffers great disturbances from catarrhal process of the uterus is often observed. That nasal and pharyngeal catarrh destroy appetite and interfere with digestion is well established. If irritation at some peripheral point of mucous membrane can thus derange in otherwise healthy individuals the apparatus for introducing latent force into the body, how much more important does such irritation become to individuals in whom catarrhal processes are already at work, either in the simple process of a tubular nephritis or the more complex form of catarrhal hepatitis? The tendency of nature to repair the injury is often not successful beyond this, that the progress of pathological change is nearly checked but not eradicated by the stubborn opposition of the reparative tendency.

But when the individual has to withstand not only the loss of strength inherently connected with his disease, but also the added waste of nerve force from peripheral irritation, this "tendency of nature to repair the injury" might reasonably be expected to manifest itself with even less energy and less success.

For no class of cases is it therefore as important and needful that any waste of energy be prevented as for those in whom disease has seated itself in the mucous membranes through which the body receives its store of energy in food and atmosphere, and through which it eliminates the no longer usable portion of its substance.

How far to carry the application of this endeavor to prevent this waste of nerve force, is the point to which I wish now to draw attention. Stubborn indigestions have been so often relieved by the oculist that few physicians underestimate to-day the need for caution on this line, but is it not desirable to go further than this and to state that in tubular nephritis, in many cases of hepatitis, in those cases of diabetes where the element of nerve strain or worry is a large factor in the etiology, in catarrhal affections of the pulmonary membrane, as well as in vesical and intestinal catarrh, careful search should be made for the co-existence of any peripheral irritation, and if found suitably corrected, with the definite purpose of preventing any portion of nerve force going to waste in individuals whose power to produce it is crippled and in whom a diminished tendency to repair has inevitably resulted. This is treating a patient and not the disease.

To quote long series of cases is not to the purpose, but it is well to state that in a large number of cases within the past two years careful examinations especially of the eyes have been made, and while in many no difficulty was discovered, yet in a considerable number peripheral sources of irritation were found, after the relief of which marked improvement in the course of nephritis, diabetes, hepatitis, and pulmonary catarrh was observed. This is in accord with Weir Mitchell's statement in 1876, of his conclusions as to headaches from eye strain, "that in many cases the eye trouble becomes suddenly mischievous owing to some failure of general health or to increased sensitiveness of brain from mental or moral causes," and writing in 1894, he says again, "you often see people who owe to ill health a suddenly intensified capacity to feel an eye strain." If eye strain, why not of any other peripheral irritation?

My own conviction is that I have not fairly discharged my obligation to a patient with trouble of this character till I have satisfied myself either by my own or the special examination of others that no peripheral irritation exists, or

such irritation being found, till it is corrected. This conviction is based on the *a priori* reasons already given, and on a considerable number of cases, of which I desire to relate but three.

CASE I.—K. Referred by Dr. Straight; occupation bookkeeper; previously under other advisers for three years, treated for Bright's disease; 26 years old, well-knit figure, weight 130; pulse 78, temperature 98.8°; slight left vent. hypertrophy; catarrhal rales the left anterior apex; just now principal complaint is of stomach symptoms, loss of appetite and slight constipation. May 6th, 1893, 24 hours' urine, three pints; urea, 250 grains per day; sp. gr. 1013; casts granular, epithelial and slightly fatty. July 1st, weight 126, pulse 82, temperature 98. May 10th, has been complaining of headache, for which he was referred to Dr. Millikin, with following report:

"O. D. +6.00 (.) +1.00 D. cz. ax. 5 deg.

"O. S. +2.00 Ds.

"Vision of the right eye with the best glasses obtainable is very poor, while the left eye is perfectly normal. In addition to the high degree of hypermetropic astigmatism he has an external insufficiency of 12 degrees, so that you can readily understand he might have any amount of trouble as the result of visual and muscular deficiencies of his eyes. I have ordered for him glasses to correct the refraction error, and will watch him under the use of the glasses, and possibly the muscular condition may require operation to produce a better equilibrium of the eye and muscles."

Relief from headache rapidly followed as anticipated, and the most gratifying improvement in the course of his renal difficulty was noticed. Strength and vigor increased, appetite improved, sleep more refreshing, urine markedly less albuminous, and urea increased to 350 or 400 grains per diem, sp. gr. 1017.

Expresses himself as "unconscious of anything wrong" and thinks the glasses have helped him wonderfully. The

casts are fewer but with granular epithelium and some fat still.

Case II.—Mrs. E. P., æt. 24, one child one year old, was well and hearty (weight 130 lbs.) until she had la grippe 3 years ago, then she lost weight to about 105 lbs. Pulse 108, soft, minus F. minus V. Temperature 99.2.° Physical exploration. no rales, cog-wheel breathing, transference of heart sounds, slight expiratory murmur left post. inf. lobe. and both apices anteriorly. Headaches, vertical, distressing cough without expectoration; cervix left side torn, womb heavy, retroverted and retroflexed. Referred to Dr. Humiston.

April 23; has been operated and condition much improved, but she is still easily exhausted and has temp. 99.2° with cog-wheel breathing as before, accompanied by rales in right mammary region. Cough has disappeared.

The improvement after laceration was repaired was most striking. The cough, which had stubbornly resisted many medicinal agents, stopped entirely the third day after the operation. A marked gain in strength resulted, and the gratitude of the patient for well-recognized benefit from the operation was freely expressed. The persistence of the catarrhal condition in the pulmonary membrane was of ill omen, and at present, while quiescent, it prevents her complete recovery. It constitutes, I believe, the primary difficulty from which she suffers.

Case III.—Mr. R., æt. 47 years, American, referred by Dr. Straight. Not a user of alcohol, smokes three or four cigars a day, bowels regular, digestion good, "has been wonderfully well." He is not a large eater, but eats meat three times a day and very rapidly at that. Weight 182 pounds, nervous temperament, pulse 82, temperature 99.2.° August 5th, in twenty-four hours urinated six times, total 3¼ pints. Sugar less than 1-10 per cent., about 24 grains per day. Diet restricted. August 13th, 3½ pints per diem, no sugar in specimen. Avoided sugars only; great lassitude and very easily fatigued. Referred to Dr. Millikin for ex-

amination of eyes, who reports that his eyes are about emmetropic and seemed to be perfectly normal and healthy. He has, however, an internal muscular insufficiency amounting to nearly 3 per cent. at distances. The glasses he has been wearing are also a little too weak, and they have evidently produced some strain on the eye.

December 27th, 1893. The glasses prescribed by Dr. Millikin to correct the difficulty described have given great relief. He has eaten heartily on Christmas day of white bread, cranberry jelly, boiled potatoes, "Christmas dinner" throughout. Urine after this meal shows no sugar. . . . May 1st has had great business care over a lawsuit threatening not only his own property but investments made by others at his solicitation. Under this anxiety sugar reappeared, but was relieved at the successful termination of the suit. As sugar disappeared his strength and vigor increased. At no time in the course of this case has sugar been found in the morning specimen. Always when found it appeared just after meals.

None of these cases are reported to show cures, for none of them have been so fortunate; but in each of them the systematic investigation for possible sources of waste of energy was undertaken in the face of the patient's protest, and only done on the assurance that they must attend to this or find another physician. My feeling in these as well as other cases not reported is that the resulting good to the patients has far outweighed all I have seen accomplished by direct medication, and I believe these measures to constitute a part of that good hygiene in the details of which we all aim to instruct our patients.

THE EFFECT OF OBSTRUCTION IN THE UPPER AIR-PASSAGES ON THE GENERAL HEALTH.

JNO. A. THOMPSON, M. D., CINCINNATI.

There is an opinion altogether too prevalent among physicians that obstructive disease in the nose or throat is purely local in its effects. To show that any obstruction here may decidedly impair the general health, I wish to report four illustrative cases. I have chosen these cases, not because there is anything unusual in them, but rather for their commonplace features. They represent the ordinary, every-day work of specialists in diseases of the nose and throat. Similar cases could be quoted by the hundred, but these I think are sufficient to illustrate my theme.

CASE I.—J. G. B., age 33 years, about five feet seven inches in height, slender, decidedly nervous. He drinks moderately, smokes excessively, but otherwise lives a well-regulated life.

When a boy of twelve he met with an accident while coasting which resulted in a fracture of the cartilage of the septum. Being afraid of punishment at home, he did not report the accident, and no attention was given the nose at that time. The usual result followed; a chronic perichondritis with thickening of the deformed septum, and in this case its eventual adhesion to the middle and inferior turbinated bodies on the left side. The left nostril was almost completely occluded. No attention was paid to this condition until the winter of 1893. I saw him first in October, 1893. The external deformity was marked. An irregular growth closed the left nostril. There was some hypertrophy

of the turbinated bodies in the right nostril, but not nearly so much as we usually find in one nostril when the other is obstructed. The secondary catarrh of the naso-pharynx and larynx was very slight. I advised immediate operation. The operation was made the next day and proved to be the most difficult of its kind I have ever attempted. After sawing the thickened portion of the septum loose from the cartilage, it was necessary to dissect, with the knife, the tumor growth from the turbinated bodies. The hemorrhage, always excessive where the turbinated bodies are the field of operation, made this dissection a very difficult job. The operation wound healed rapidly, without suppuration or any other complication. The secondary catarrhal troubles were very easily cured after the removal of the cause. In the middle of March, 1894, the patient, who had not been under treatment for months, called to see me on account of a slight acute rhinitis. He volunteered the statement that his appetite had improved from the time of the operation, and at the time of this visit he weighed thirteen pounds more than he ever had in his life before. He had had no treatment, constitutional or local, and had not changed his habits or manner of life in any way, so that there can be no question that the improvement in his general condition is due to the restoration of nasal respiration.

CASE II.—M. S., age thirteen months, has always been a very delicate baby. She is very small, slight, and has the typical appearance of a scrofulous child. She did not thrive either on mother's milk or on the bottle. Her life was preserved with difficulty up to the time when she was able to eat prepared foods. The arrival of this period complicated rather than aided in the difficulties of giving her suitable nutriment. Every food suggested by her mother, nurse or physician, Dr. W. H. Taylor, would be refused after being used for a few days only. She had frequent and severe diarrhœal attacks. She caught cold and had bronchitis on the slightest exposure. I was called in during one of these attacks in January, 1894, to see if there was any local con-

dition aggravating the cough. At this time it was so severe that the sleep of the child was constantly broken and both parents were worn out by the constant care required. There was nothing in the nose, pharynx or larynx except the acute catarrhal inflammation we expect to find coincident with bronchitis, but the open mouth, sunken nose and distended veins over the nose and forehead were strongly suggestive of obstructive disease in the naso-pharynx. A digital examination showed the presence of a moderate amount of adenoid vegetations. A spray of hydrastis was directed to be used through the nose every four hours for ten days to overcome the acute catarrhal inflammation present. At the end of this time, with the assistance of Prof. Taylor I removed the adenoids with forceps and curette. The operation wound healed without suppuration. The mother reported an improvement in the child's appetite and general condition within one week. Two weeks after the operation she reported that the difficulty in feeding the child was exactly the opposite to what it had been before. The problem now was to prevent her from eating too much. She was as ravenous as a convalescent typhoid fever patient. One-half cup of rice boiled in mutton broth had sufficed for a meal before the removal of the adenoids; two weeks after the operation, three cups were eaten and the child wanted more. The improvement has continued up to the present time. The child has gained in flesh and strength, and romps and plays as a baby should. The only treatment other than operative, was syrup of iodide of iron, given for two weeks to prevent recurrence of the adenoids.

Case III.—Dr. D., of Vevay, Ind., practicing physician, age 37 years. He is as regular in his habits as a country surgeon can be, and is temperate in all things except the amount he smokes. He uses tobacco to excess in this way, and this habit accounts in part for his nervous condition. I saw him in June, 1893. At that time he gave me this history. For ten years he did not remember a time when he had been entirely free from headache. Every month he would have

a paroxysm that would confine him to bed for two or three days. For a week following this attack, the gastric disturbance was so severe that he would be unable to eat. He tried every remedy or method, reasonable or unreasonable, for the relief of the headache before he had the nose examined. Everything else failing, he thought possibly the headache might be a nasal reflex and came to Cincinnati to see me. I found on examination that there had been a fracture of the cartilage of the septum. It was sharply bent towards the right nostril and the thickened angle crowded on the inferior turbinated body. This structure was congested and the surface had an angry look. The nose was too much inflamed to permit operation when I first saw him. The morning of July fourth I removed the projecting portion from the septum with a saw. The patient returned home that evening and I saw or heard nothing from him until late in October. He called on me then on his way to the World's Fair. He told me that the headache disappeared three days after the operation. He had not had an attack for nearly four months. The constant dull pain over the eyes was gone within three days and had not returned. His general health had been greatly benefited, with no tonic treatment and no change in his habits or work. He had gained fifteen pounds in weight and was feeling better, stronger and more able for his professional duties than he had been for ten years.

CASE IV.—H. G., aged four years, weighed only twenty-nine pounds, has always been very delicate, appetite never good, has attacks of bronchitis on the slightest exposure. These attacks were accompanied by dyspnœa, strongly suggestive of beginning asthma. His tonsils were enormously enlarged and the naso-pharyngeal space filled with adenoid vegetations. He had been examined and treated repeatedly by good physicians, who, for some reason best known to themselves, had advised against operation. I saw him first March nineteenth, and advised immediate removal of both tonsils and adenoids. All other treatment, general and local, having failed to benefit the boy, the parents agreed to the

operation, although with considerable reluctance. Two days later the child was anæsthetized and both tonsils and the adenoids removed at one operation. The operation was followed by an attack of bronchitis. The wounds healed comparatively slowly, so that it was two weeks after the operation before he had thoroughly recovered from its effects. Three weeks later the mother reported that the child could rest well, had a good appetite and had gained six pounds in weight. No internal treatment of any kind was used except simple remedies for the bronchitis, which were administered during the attack. The gain of two pounds per week can be attributed to nothing but the beneficial effects of removing the obstructions from the upper air-passages.

That these are not exceptional cases is proven by Woolen's statistics. He has kept careful record of all cases treated in twelve years of practice. He finds that seventy-five per cent. of all patients with obstructive disease in the nose or throat are below the weight for height, given as the average in all our tables of vital statistics. His experience confirms mine that after the establishment of nasal respiration patients gain their normal weight and strength.

There are several ways in which these obstructive diseases produce their deleterious effects. These diseases cause dyspepsia and consequent malnutrition in two ways. When respiration is interfered with so that mouth-breathing becomes necessary, the patient cannot properly masticate and insalivate his food. It must be swallowed hastily and in coarse lumps to give him the opportunity to breathe. With poorly masticated food, stomach digestion is not perfectly accomplished, and the whole train of digestive changes necessary to the absorption of nutrition is interfered with and dyspepsia results. Where the nose or naso-pharynx is obstructed, there is always more or less decomposing secretion accumulating in the oro-pharynx or naso-pharynx. This decomposing secretion, with its colonies of bacteria, is carried to the stomach with the ingested food. The decompo-

sition begun in the throat continues in this organ; the mucous membrane of the stomach is irritated and a chronic stomach catarrh set up by these decomposing ingesta and their contained bacteria. The interference with stomach digestion thus brought about impairs the general nutrition.

In another way obstructive disease in the upper air-pas sages interferes seriously with the assimilation of the agent essential in all processes of nutrition. It is one of the A, B, C's of chemistry that osmosis will not take place readily through an animal membrane unless the membrane is moist. In the mouth-breather the inspired air is not warmed and moistened as it is in normal nasal respiration. The mucous membrane of the lungs in the bronchi and alveoli is kept abnormally dry by the inhalation of air not properly moistened. This abnormal condition interferes with the free interchange of oxygen and carbonic acid gas between the blood in the arterial capillaries and the air in the alveoli, hence the most important of all agents in nutrition, oxygen, is present in the blood in less than the normal proportion; the chemical changes which make up the process of nutrition are imperfectly completed from lack of the necessary vital element. Instead of the perfect nutritive metabolism, imperfect or toxic agents may be formed.

Another and very important way in which obstructive disease in the upper air-passages affects the general health is through disturbed sleep and loss of necessary rest. No person who breathes through the mouth at night obtains sleep as quiet, as restful, as restorative as sleep where respiration is normally performed. The child with adenoids or enlarged tonsils, or the adult with an obstructed nose, is always a restless sleeper, turning and tossing in the bed, waking with sudden starts, often with the sense of impending suffocation, and arising in the morning dull and unrefreshed. The imperfect absorption of oxygen has the same effect with these mouth-breathers as sleeping in an unventilated room has on the healthy person. They rise in the morning with coated tongues, bad taste in the mouth, offensive breath and a feel-

ing of weariness or lassitude that often requires some hours in the open air to overcome.

Finally: these obstructive diseases have a deleterious effect on the general health in another way. In the crypts of the enlarged tonsil, in the interstices of adenoid vegetations, or in the naso-pharynx or nose when this latter organ is obstructed, chronic suppuration is always going on. The ptomaines which result from this bacterial growth are constantly absorbed by the mucous membrane and their toxic effects exerted throughout the whole system. We find these patients anæmic and weak, physically and mentally. The tonic they need is platinum in the galvano-cautery point, or steel in the form of the tonsillotome, the nasal saw or post-nasal forceps and curette.

HEADACHES, AND THEIR RELATIONS TO OPTICAL AND MUSCULAR DEFECTS OF THE EYE.

S. C. Ayres, M. D., Cincinnati.

In looking at a near object we accommodate and converge at the same time. This brings into play both the intrinsic and extrinsic muscles of the eye, the ciliary muscle and the internal recti. When the ciliary muscle is normal and the eye emmetropic, and there is no disturbance in the ocular muscles, the visual act causes no pain whatever. We see things near and far without consciousness of pain. When the eye deviates from the normal or emmetropic eye, asthenopic symptoms manifest themselves. But it does not follow that *all* deviations from the emmetropic eye cause asthenopia. Far from it. Emmetropic eyes are in the minority, and ametropic eyes in the great majority, and the latter do not *all* suffer discomfort in the use of their eyes. Many persons with hyperopia and hyperopic astigmatism have good strong working eyes, equal to any kind of use. Many myopes have no asthenopia, and while for the distance their sight is imperfect, yet for near work it is excellent.

Taking the great class of ametropes into consideration, it is a question of interest to discover why some suffer in the use of their eyes and others do not. Many persons with optically imperfect eyes go through their entire lives without suffering any inconvenience in the use of them. Children in school with equally imperfect eyes, optically speaking, sit side by side, and yet one suffers and the other does not. So men and women work at their desks and lathes and tables and sewing-machines, some suffer and others do not.

been devised for estimating the anomalies of the muscles, but it would be out of place here to go into a description of them. With their aid the deviation of one degree or even less can be measured. I will only mention one test, the Maddox Prism. The test is purely scientific, and yet so simple I will ask your indulgence for a moment while I describe it. The patient is instructed to look at a lighted candle which is placed in front of him. Presuming that the eyes are equal or nearly so, a glass cylinder is placed horizontally before one of the eyes. The patient now sees one candle and a vertical streak of light, the latter coming from the eye before which the cylinder is placed. If the muscles are normally balanced, the candle is seen in the centre of the streak of light. If any deviation occurs, the streak of light is seen either to the right or left of the candle. With a prism placed base inward or outward, the streak of light is made to pass over to the candle. The prism which accomplishes this marks the heterophoria. An exact mathematical expression of the deviation from the normal balance of muscles is thus obtained. One is able to determine to a nicety the muscles at fault, whether of the internal or external recti. But there is something more than this discovered by the use of prisms. The test I have just described might be misleading if it were not carried farther. When the eyes are at rest, the candle may be in the streak of light during the test and yet there may be a weakness of the muscles which only shows itself by prolonged work. In order to determine farther the relative strength of the muscles, their power of adduction and abduction must be tested. It is here that a latent weakness is often detected. This test must be made with stronger prisms, those running from 10° to 20.° In the normal eye the internal muscles are able to overcome from 30° to 50,° and the externi from 6° to 8.° A careful test will frequently show the internal muscles too weak to keep up prolonged work, or the fault may lie in the externi. Muscular weakness of the eyes often exists in persons who are anemic or overworked or badly nourished, when the refraction of the eyes

may be nearly or quite normal. It is often the most important factor in the asthenopia, and should be carefully investigated. That heterophorias cause much distress is a fact daily demonstrated by every oculist. This distress is not only physical but mental. Headaches and browaches are followed by a feeling of mental languor and lassitude. A want of confidence in the eyes ensues, so that the sufferer becomes demoralized. He may be dependent on his eyes for his livelihood, and his inability gradually produces a marked mental disturbance. Let me give you a typical case. A young man of twenty-two in the postal service had much distress in the use of his eyes. He was compelled to work at night under imperfect light while the cars were going at full speed, and to work with great rapidity. The pain and mental distress connected with his work was so great that he could scarcely follow his occupation, and he said he would commit suicide if he could not get relief, so demoralized was he. Upon examination his vision was found perfect in both eyes, and almost emmetropic. There was a slight degree of hypermetropia, but not sufficient to account for his trouble. A test of his muscles showed that he had a marked insufficiency of the internal recti, 8° on one side and 9° on the other. The result of this was that he could only use his eyes a short time without discomfort. The muscle equilibrium was so disturbed by the tendency to divergence that he suffered almost constantly while at work. In such a case two methods of treatment could be resorted to, either a systematic gymnastic exercise of the weaker muscles with a view to strengthening them, or a tenotomy of the stronger ones in order to restore the muscle balance in this way. The former method was resorted to, and with the most gratifying results. By placing strong prisms before the eyes with the bases out, thus forcing the internal recti muscles to act, they soon gained in strength. In addition he was ordered a pair of weak prisms for constant use. These exercised a gentle influence on the ocular muscles, and with the daily exercise of the strong prisms gave him

the desired relief. In a month he was practically relieved, and has been attending to his duties ever since. Many cases of asthenopia occur in persons where there is no refractive error to be corrected, but where the trouble is purely muscular The case just mentioned is a striking one, but a critical investigation of the muscle equilibrium will develop similar weakness in eyes where vision is perfect. In these cases operative interference is often necessary. Sometimes the internal and external muscles have to be tenotomized. Such operations have to be done with great care lest too much effect be produced. With the aid of the Maddox Prism we can regulate the extent of the tenotomy with great exactness. The muscle can be partially cut and the test made with the images of the candle as described before. If the images do not blend, a slight increase in the effect can be made until the desired effect is produced.

A disturbance of the muscular equilibrium is often caused by an anomaly of refraction. This is notably the case in hyperopes, and after the proper correcting lens is adjusted the muscular action is again harmonized.

There is a popular objection to the use of glasses in young persons on the ground that when once on they can never be taken off. This is not strictly true. Where the refractive error demands the glasses, they should be worn constantly; but many times the glasses are like the crutches and canes the surgeon orders to tide over a period. The conditions which render a prescription for glasses necessary are so complex that they demand a careful and critical investigation into all the possible and probable factors in the case, and this work should never be undertaken by vendors of glasses.

In the treatment of ocular headaches, particularly in young persons, the physician and oculist should mutually supplement each other's work.

SYMPATHETIC OPHTHALMIA.

B. F. TEMPLETON, M. D., ZANESVILLE.

Ever since 1844, when Dr. Wm. McKenzie, of Glasgow, gave the first accurate description of sympathetic ophthalmia, claiming for it a distinctly nervous character on account of the pathological views reigning at that time, his views have been held, until the past few years. While at present there are very wide differences of opinion concerning the pathological changes, nature of the disease and the treatment, and since Dr. McKenzie's time, as the result of additional cases, our knowledge has increased and we know more of the complications which may arise and of the individual differences which may present themselves, still, the important fact remains established that a pronounced and usually fatal inflammation may arise in one eye as the direct result of an inflammation of the other eye.

There are at present two prevailing opinions concerning the pathology of sympathetic ophthalmia. One is a development of Dr. McKenzie's opinion of the nervous character, but instead of asserting that it is propagated through the optic nerve, this theory regards the ciliary nerves as the means of transmission. The other view is, that the inflammation in the second eye is due to the presence of bacteria which have penetrated it through the perivascular lymphatic system of the optic nerve.

The former was the prevailing view twenty-five years ago, while the latter view is held by eminent teachers of the present time. While the weight of evidence tends to the acceptance of this belief, there is anatomical proof of the

existence of this disease without alteration of the optic nerve. Therefore we are obliged to consider the transmission by the ciliary nerves, or some other source. But whatever views may be accepted as to the pathogenesis of the disease, the clinical picture as originally drawn must be regarded as a remarkable instance of the result of keen observation on the part of Dr. McKenzie; but since his time our knowledge has increased from the result of additional cases, so we now know more of the complications that may arise and the various ways of the pathological conditions being manifested. However this may be, the important fact remains that an eye seriously inflamed may result in the serious inflammation of its fellow. An inflammation of one eye of long standing, then, may result in inflammation of the other eye. This period varies greatly, from a few days to even years. We find that the longest period is much more difficult to determine for the reason that the eye inflamed may receive a new injury which may be unknown to the patient (or perhaps known and forgotten), thereby complicating the history and course of the disease so that an exact statement is unwarrantable and often impossible.

Ault, in his collection of these cases, states a case as late as sixty years after the injury and as early as seven days, and I observed in one case a slight sympathetic inflammation as early as three days.

The first symptoms to show are usually an inflammation of the ureal tract. It may be an irido-cyclitis, an irido-keratitis, or an irido choriditis, or a simple plastic or serous iritis. Earlier observers were of the opinion that it was a retinitis, followed or accompanied by iritis, but we now know that the retina is not necessarily the first part affected, and in fact, when the disease is of a very mild form, the retina sometimes is not affected in the least. The trouble may come on with or without warning, and it is for the reason that it is sometimes without warning that it has done such serious damage, getting beyond our control before the

patient is aware of the existence of such a relentless affliction.

In its slightest form the sympathetic manifestations may be only an irritation from using the eye, an intolerance of light, pain after reading, weakness of accommodation and a rather slight redness of the circumcorneal conjunctiva. While the above symptoms may be manifested in other troubles than sympathetic ophthalmia, yet when we find these symptoms a rigid examination is called for. We should search for any undue tenderness in the ciliary region, using usually a blunt probe, and if the trouble exists it will find a circumscribed spot that is unusually sensitive and a corresponding spot in the other eye may be found to be also tender and painful.

In more severe cases the eyes may have been or are very intolerant to light for years without structural change taking place. The progress of the inflammation once started is very rapid and intractable to the action of our various remedies. Mydriatics have absolutely no control over the iris. The pupil is occluded, and the edge remains adherent to the lens and the iris bulges forward. At first the globe is hard and tense, but later the tension diminishes and gives place to an atrophied condition of all the interior structure shown in the collapse, with depressions at the insertion of the recti muscles.

The treatment depends largely upon the amount of vision possessed by the injured or diseased eye, also upon the character and situation of the wound, and *more* especially upon the duration of the disease.

Prophylaxis at all times is the main point of treatment, or in other words, attend strictly to the originally affected eye. Confinement in a darkened room is sometimes too strictly adhered to. While the darkened room is necessary, yet the patient should have a moderate amount of outdoor exercise with the eyes well bandaged, and on general principles iron and strychnia and full doses of quinine are beneficial.

Locally, atropine in 2 grs. to the ounce solution is of use unless there is undue tension or atropine irritation; the atropine paralyzes the action of the iris and ciliary muscles, thereby keeping them at rest. Eserine solution and peroxide of hydrogen, leeches may be used on the temple, or cupping may be substituted when leeches are unobtainable. Mercury may be used until gentle salivation is reached, with the idea that it checks or retards adhesive inflammation.

In some cases the above treatment is followed by such favorable results that the oculist is built up; is hopeful of the next case that comes under his care. When alas! he has used the atropine, leeches, mercury, etc., he sees the iris contract surely day by day, bulging out to a fearful degree, and lymph poured into anterior chamber until it becomes hopelessly filled up, and the ultimate outcome is blindness. While the before-named remedies are used generally and their good effects should not be underestimated or questioned, yet the oculist is doing his patient an injustice as well as himself where he gives him much ground for hope.

When the permanently injured eye is involved to such an extent that vision can not be restored, enucleation is the surest means of preventing sympathetic inflammation, and even the enucleation falls short of our expectations in preventing sympathetic ophthalmia is some cases.

I had a case requiring prompt enucleation some time since where recovery was prompt and I discharged the case. About twenty-two days afterward the patient returned to me with a decided case of sympathetic inflammation which caused me not a little trouble. There are certain conditions where I think enucleation is contraindicated; such as a diseased eye where there is slight vision after inflammation has begun, which in the end may become the most useful eye.

Operations are not generally advisable on the eye that is affected with sympathetic inflammation, but rather let the eye rest as far as operative interference is concerned, until

the acute symptoms have passed, unless there be interocular tension, when scleral incision may be resorted to.

Enucleation in the primarily affected eye should be performed on

1st. An eye injured by and containing a foreign body which cannot be removed, which has set up iritis, even though sight is not gone.

2d. An eye that has been destroyed, even though it be not painful, if there be any sympathetic symptoms in the other, to remove any source of irritation should be removed.

3d. An eye with a wound so situated that the iris being so destroyed the following inflammation will sooner or later destroy the vision.

4th. An eye in which the wound may or may not have destroyed the lens but has injured the cornea and iris, in which there is periodical sympathetic inflammation.

5th. An eye that has by reason of an injury become atrophied, where the other eye shows any symptoms of sympathetic inflammation.

Several years ago Von Graefe advocated the advisability of dividing the optic and ciliary nerves behind the injured eye, on the ground that they were considered the means of transmission. While medical literature was for a few years plentifully supplied with reports of this (optico-ciliary neurotomy) operation, it has not received the degree of indorsement that enucleation has, and therefore has fallen comparatively into disuse; partly from not receiving the undivided sanction of the ophthalmologists, and not being able to guarantee relief to the patient, and the uncertainty of making the division of the ciliary nerves successfully.

One of the remedies not mentioned is cocaine, which can be used with eserine, or atropine solutions to relieve pain (cocaine not to be used for a long time at once). Whatever treatment is followed requires a strict observance of the symptoms and treatment accordingly, and be cautious and not let anxiety overcome your good judgment and overdo the treatment.

DISEASE OF THE CORNEA IN CHILDHOOD.

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There is no one disease of the eye so frequently met with in childhood as disease of the cornea. Sometimes inflamnation or ulceration of the cornea is a complication, as in ophthalmia neonatorum, or pannus, resulting from granulations; but in the disease that we wish to consider to-day the inflammation is from the beginning one of the cornea. To thoroughly comprehend and understand the importance of diseases of the cornea, it becomes necessary to refer to the anatomy of this structure. The cornea is the anterior clear part of the eyeball; transparency is its main physical property. We cannot say positively what this condition is due to, but it is generally accepted that it is due to the peculiar arrangement of the delicate fibrils and bundles of fibres of the corneal tissue proper. The cornea consists of five separate and distinct layers. The first is made up of seven or eight layers of epithelium, which rests on a delicate connective tissue layer or basement membrane. The third layer is called the "substantia propria." It is made up of small bundles of delicate connective tissue fibrils, so arranged that the various layers cross each other at right angles or nearly so. This admits of small spaces and interstices between the bundles of fibres as well as the different layers of bundles. The spaces so created are used as lymph channels, and from

this source the cornea receives its nutrition, its blood supply, as it were. The fourth and fifth layers are a basement membrane, and an endothelial layer, respectively.

The epithelial layer is a modification of the bulbar conjunctiva, the true corneal tissue is a continuation of the sclerotic, and the endothelial layer is looked upon as a reflection from the iris and ciliary processes. All rays of light that enter the eye must pass through the cornea, and to make the visual act perfect, absolute transparency is necessary. In every form of corneal inflammation there is a disturbance of the transparency of the cornea.

Any diseased condition interfering with the circulation or, in other words, the nutrition of the cornea, may cause an opacity, either by an infiltration of material into or between these corneal layers, or by breaking down the tissue itself. The anterior layer is constantly shed and reproduced, so that if an abrasion should occur, repair takes place without any damage. The second layer, the elastic membrane, is calculated to act as a barrier to disease, as it does not yield easily. The third layer, which appears to be a continuation of the sclerotic coat, has its fibres and layers of fibres peculiarly arranged, and possesses its refractive properties as well as transparency because of this arrangement. Repair of the second and third layers is always by scar tissue, which is not transparent. The fourth and fifth layers are an elastic and endothelial layer respectively. The nutrition of this structure is through lymph channels continuous from the sclerotic coat. The nerve supply is rich; branches from the fifth; the many fibrils losing their sheaths as soon as they enter the cornea. Diseases of the cornea for the sake of ready description are divided into three classes, viz.: (*a*) Infiltration, (*b*) abscesses, (*c*) ulcers. The largest number of diseases of the cornea in childhood can safely be said to come under the classification of infiltrations, while the phlyctenular variety is the most frequent type.

PATHOLOGY.—According to the observations of Ivanhoff, there is a subepithelial exudation of fluid, caused by an irri-

tation along a branch of the fifth nerve, as it passes to the epithelial layer, causing an elevation or bubble. There is a collection of round cells at the end of the nerve, and this causes the typical phlycten. The infiltration may extend deeper and the haziness of the cornea become greater. Should, for some reason, the infiltration become so extensive as to disturb the arrangement of the true corneal tissue, an indelible opacity may result; or the pressure of the exudate may become so great as to cause a breaking down of the various layers and cause an abscess or ulcer. Phlyctenular keratitis is circumscribed, not very extensive, but secondary changes may set in and give us a picture much modified from the one just described. The epithelial covering is very fragile, and in a few hours we have resulting an ulcer. In certain patients and under certain conditions this apparently simple pathological process at the onset becomes very difficult to treat and not infrequently endangers vision. Here we may encounter many subdivisions, wholly dependent on the fact that the changes caused in the cornea and the various structures of the eyelid, which naturally follow as a consequence of inflammation of the cornea, are not always the same in different patients, or under different circumstances in the same patient.

This disease is almost distinctly a disease of childhood, seldom observed before the age of two years and not often after the age of ten years, unless it is due to refractive trouble. It may appear in one or both eyes, but usually one eye is involved first.

Scrofula, as was once supposed, has nothing to do with the causation of this disease, but it runs a very tedious course in children belonging to this class, because of their general condition.

A process that appeared quite typical in the beginning may rapidly extend to the deeper layers of the cornea, and danger of perforation and prolapse of the iris becomes imminent. On the other hand, instead of remaining circumscribed, the process of infiltration may extend over a

greater portion of the cornea, new blood-vessels develop in the cornea, and an indelible opacity remains. In the colored race we not infrequently see a complete chain of vesicles extending around the sclero-corneal border.

CAUSATION.—Little definite can be said about the causation of this disease, unless we accept the theory recently advanced that it is due to a micro-organism. It is definitely known that it can be brought about by inoculation. Constitutional taint and poor hygienic surroundings play an important role as a causative factor in childhood. In the majority of cases it is found in the homes of the poor. The children of parents with syphilis or tuberculosis, especially where the nutrition is below par, are often subject to the worst form of this disease.

It is the writer's opinion that the anterior layer of the cornea is the same as the conjunctiva histologically, and is therefore subject to the same etiological factors that the conjunctiva is. It is a well-known fact that the mucous membrane of the child, be it in the nose, lungs or alimentary tract, is more susceptible to disturbing causes than in the adult. It is a frequent complement or sequela of the infectious diseases, possibly caused by the same agent, yet we are not ready to say that it is contagious. In some patients attacks of phlyctenular keratitis come on quite frequently without apparent cause, unless it be that they are using their eyes. Their eyes are on a strain, caused by some refractive error, or muscular asthenopia.

There is no longer any doubt that the hygienic surroundings of a child is an influential agent in this disease; if not as a causative factor, then it very much modifies the course, because the majority of these cases are found in the houses of the poor.

SYMPTOMATOLOGY.—The symptoms of this disease are characteristic. While it may run an acute course in one instance and a chronic course in another, the subjective symptoms are so typical that a diagnosis could be made as the child is passing through your door-way in its mother's arms.

The most marked and obstinate symptom is photophobia, or sensitiveness to light. It was supposed that in the exposure of the sensitive nerve-endings, as in the process just described, we had a good explanation of this symptom; but in some of the worst cases the amount of photophobia and the extent of corneal damage is so out of all proportion, that, in my estimation, we must look for another explanation of the symptom. A great deal of the nervous element seems to be present. There is a spasmodic contraction of the orbicular muscle. The frontal and orbital muscles are firmly contracted, and it is often quite difficult to even get a glimpse of the cornea. Anæsthesia, external canthotomy, plunging the child's head under water as a means of breaking the spasmodic contraction of these muscles, have been suggested by the oculist in his desperation to do something in these cases. Tearing is profuse; when the lids are pulled slightly apart a gush of water takes place as if you had caused a loss of the aqueous humor. In older children, you will find that they are constantly mopping their eyes. This secretion is many times so acrid as to cause excoriation of the integument of the face about the eyes, nose and lips. When the lids are forcibly pulled apart, there is bleeding at the external angle and great pain is caused. The eyelids are swollen and puffy, caused by a disturbance of the circulation in the eyelids. The conjunctiva of the lid and bulbus is reddened; the cause of the redness is not due to conjunctivitis, but is simply an extension of the irritation from the cornea. The most frequent seat of the disturbance is at the sclero-corneal junction; it may be but a small abrasion, or extend along this border for some distance, or we will find a distinct vesicle slightly elevated, looking as if it had a gelatinous base, situated at the margin of the cornea, and possibly fringing the entire circumference. When the phlycten is situated on the cornea, as a rule, a bunch of blood-vessels cross over at the nearest corneal border and run towards the vesicle. These vessels are new formations, and are quite superficial. Sometimes the phlycten. has clear-

cut edges, and then again a margin of infiltration extends into the surrounding corneal tissue for quite a distance. It is more frequently that we see the phlyctenular process as an ulcer, with a dirty base, than a vesicle, since the covering is quite delicate, and is easily broken. These many variations that have been so briefly referred to, are no doubt produced by the same cause, but the idiosyncrasies of the patient, his habits and surroundings, are the reasons for the difference in appearance.

PROGNOSIS.—The prognosis of this particular form of corneal disease is not so unfavorable as might at first appear. The process is one involving but the superficial layers, and while the infiltration may be quite extensive, the clouldlike opacity disappears quite easily. Should an ulcerative process set in and extend to the deeper layers, repair is by cicatricial tissue, and an opacity, more or less dense, will remain permanently. It is in this manner that perforation of the cornea, with all its unpleasant symptoms, occurs; but this is fortunately exceedingly rare. It is easily comprehended that only when an opacity is centrally situated, or extends into the pupillary area, does it disturb vision. Relapses are not infrequent, and may continue to annoy the child for years. There is another point that we must refer to in this connection, namely, the sluggishness of repair in many cases. It may require months of patient treatment to repair the damage done in two or three days. The newly formed blood-vessels get smaller and finally disappear; the general infiltration is cleared up, leaving a clear-cut, sharply defined grayish opacity at the seat of disease. The redness of the conjunctiva disappears as the disease runs its course.

DIFFERENTIATION.—It is not difficult to diagnosticate disease of the cornea. If the opacity is dense and centrally situated, then there is danger of mistaking it for cataract by the uninitiated. In the variety called Bueschelfoermige Keratitis by the Germans, where there is a profusion of blood-vessels developing on the cornea, all pointing in the

direction of the seat of inflammation, there is some danger of mistaking it for pterygium; or if the vessels come from above down, for pannus.

TREATMENT.—There are three points that we must remember in the treatment of this disease: First, the etiological factors in the case; secondly, the corneal process itself; and lastly, the accompanying symptoms. The all-interesting point in this disease is the treatment.

Whenever the cause of the inflammation can be discovered, it is well that you direct your treatment accordingly. At times these attacks come on with a regular periodicity, and quinine and tonics are indicated. In not a few cases, a refractive error is the cause of repeated attacks of phlyctenular inflammation, and nothing but a careful correction by glasses can bring about a cure in this class of cases. The child while not at school seems to be immune from this disease, but as soon as they are again called to their books their trouble reappears. These patients are perfectly healthy otherwise. Atropine has been lauded as a remedy in inflammation of the cornea, but it undoubtedly holds good only where a refractive defect is the causative factor. Where the patient is too young to correct this by the use of glasses, paralysis of accommodation with a four-grain solution of atropine is the proper thing. This treatment may be kept up for weeks without any detriment to the patient. In a child whose health is poor, illy nourished, of a nervous temperament, belonging to the so-called strumous type, constitutional remedies are indicated; not because they possess a curative action on the disease itself, but because they improve the general health of the patient. In a case with an inherited syphilitic constitution the syrup of the iodide of iron yields good results. In the child where there is a tendency to suppuration, and an involvement of the glands, sulphide of calcium is indicated in small doses. You can never predict beforehand in which case the latter agent will do good, but it undoubtedly acts marvelously in some cases, and may be administered to the smallest child even when

other remedies have failed. The appetite is usually lost, no solid food being taken for weeks. The general health suffers, and it is then that tonics and stimulants are indicated.

We next turn our attention to the many subjective symptoms; of these the photophobia is the most annoying. It may vary from a mere shyness to light, to the most intense pain as soon as day dawns. The room cannot be made dark enough, the eyes cannot be sufficiently covered to relieve the patient of the pain. In a large majority of the cases the effort to keep out the light causes a spasmodic contraction of the orbicular muscle to such an extent that the circulation of the eyelid is interfered with. In consequence the lid becomes œdematous, the outer angle is excoriated, hot scalding tears cause an eczema of the skin of the lids and face, and usually there is an involvement of the nasal mucous membrane. The patient buries its head in its mother's lap or a pillow, and cannot be persuaded to open the eyes even in a darkened room. This chain of symptoms may continue for weeks and months. Authors claim that it is caused by an exposure of the sensitive nerve-endings, due to the excoriation of the corneal epithelium. This may be true in general, but in the extreme cases the amount of real damage to the cornea is not in proportion to the subjective symptoms. In some cases, in fact, the most intense photophobia is present without a trace of disturbance on the cornea. Atropine instillations were at one time made for the relief of the photophobia, but cocaine in solution from two to four per cent. answers this purpose so much better, that atropine is recommended only where we want the effect of a mydriatic. Cocaine has the property of a mild astringent, but a little care must be exercised lest it act as an irritant, or cause poisoning in a susceptible patient.

It may be instilled three or four times a day to relieve pain. The recommendations of the older authors, to completely immerse the child's head in water until in the fear of strangulation it opens its eyes, or to forcibly pull the lids apart with retractors and expose the cornea to the atmos-

SPLENECTOMY.

WITH THE REPORT OF A SUCCESSFUL CASE.

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Mrs. A——, American, aged twenty-nine, married, II-para, was admitted into St. Elizabeth Hospital, May 29, 1893. The following history was obtained: Her family record is without taint, menstruation normal, and general health but little impaired. Mrs. A.'s early life was passed in a highly malarious district in Southern Illinois, and up to her marriage and removal to Ohio she was subject to frequent attacks of chills and fever, and carried almost constantly an "ague cake" in her side. For several years she has been free from malaria and, aside from an attack of typhoid fever, has had no serious acute illness.

The symptoms of the disorder which now so seriously interferes with the discharge of her household duties, and for which she seeks relief, first showed themselves about two years ago. She then began to have abdominal and pelvic pains, and some months later discovered a lump low in the abdomen. Examination disclosed a solid, freely movable tumor, sensitive to touch, in the left iliac region, dipping into the pelvis, but not connected with the uterus, and a small cyst of the right ovary. The uterus was normal in size, but retroverted.

Dr. Jewett, during whose service she entered the hospital, made a cœliotomy, June 10, 1893. The solid tumor proved to be a displaced spleen about twice the normal size. It was free from adhesions and easily replaced. The right ovary,

containing a cyst the size of a small orange, was removed. Left ovary normal. The abdomen was closed without drainage. Convalescence was uneventful. She was soon discharged with positive instructions to wear constantly a properly-fitting abdominal supporter, with the hope of retaining the spleen in position.

Mrs. A—— was readmitted into the hospital during my service, September 23, 1893. Shortly after her return home she again began to suffer from pelvic symptoms, and for the past two months has had nearly continuous abdominal soreness and several severe paroxysms of pain, which drove her to bed. Her abdomen has been steadily enlarging.

Six days ago, while doing the family washing, she was seized with agonizing pain in the abdomen, which required for its control the administration of morphia. Vomiting of large quantities of bile-colored fluid began on the following morning, and still recurs at intervals. In spite of treatment the bowels have not been open for more than a week. Temperature normal.

On examination, the abdomen was found tympanitic, very sensitive to pressure, and occupied by an immovable, solid tumor which completely filled the left side from the pelvis to the ribs, and extended considerably beyond the middle line. It could easily be touched *per vaginam*.

The former operation greatly simplified the diagnosis, and left no doubt that the tumor was the enlarged and inflamed spleen. The acute symptoms were attributed to intestinal obstruction, due either to pressure from the spleen or to adhesions at the seat of the ovarian stump. The symptoms grew steadily worse until forty-eight hours after admission, when the bowels responded freely to treatment, after which the vomiting ceased and her general condition improved. The respite was of short duration. The local tenderness, paroxysmal pains, and vomiting returned accompanied by fever. The temperature ranged from 99° to 101° for ten days, and measured 100° on the morning of the operation. Peritonitis had evidently supervened, and at a consultation of the hos-

pital staff it was decided that the removal of the offending spleen offered the only chance of recovery.

The operation was made October 7th, with the assistance of Drs. Jewett and Humphreys, the patient having been anæsthetized by Dr. Reeve, Jr. The parietal incision, seven and a half inches in length, was made along the outer border of the left rectus. On exploring the spleen, contrary to expectations based on the revelations of the previous operation, it was found adherent to the abdominal wall, omentum, and intestines. The intestinal adhesions especially were firm and extensive, involving the entire under and inner surfaces of the tumor. Their separation consumed much time, and even with the utmost care the capsule of the spleen was torn in several places. The peritoneum gave unmistakable evidences of active inflammation. The pedicle was long, twisted through three complete turns, and with its engorged and tortuous vessels resembled a huge umbilical cord. It was transfixed, firmly tied with heavy twisted silk, using the Staffordshire knot, and for greater security encircled with another turn of the ligature. The ligature was cut short and the pedicle dropped, a glass drainage-tube placed, and the wound, on account of the patient's condition, hastily closed.

The hemorrhage was slight and easily controlled. The shock, however, was profound and wholly out of proportion to the blood lost or the length of the operation. Hypodermatic injections of brandy and strychnia were freely used. Apart from the shock which threatened to prove fatal for hours after removal to bed, and the temperature which for twelve days measured from 99° to 101,° precisely as it had before the operation, there was nothing worthy of special comment during convalescence. No satisfactory explanation of the temperature curve could be found in the condition of the wound or patient, and indeed, without the thermometer it would not have been suspected. At no time was there swelling of the parotid or lymphatic glands.

The spleen drained of its blood weighed four and a quar-

ter pounds, and measured ten inches in length by five and a half inches in breadth. It was firmer in texture and darker in color than the normal gland. Microscopical examination, by Dr. Scheibenzuber, showed thickening of the trabecular and intercellular connective tissue and pigment in the vessel walls, "a chronic hyperplasia probably due to malaria." By an unfortunate oversight, no microscopical examination of the patient's blood was made before or soon after the operation; at present the proportion of the red and white corpuscles is normal.

Seven months after the extirpation, the date of the present report, Mrs. A——— has grown very fleshy and is in excellent health. It may, however, be worthy of record, that ever since the operation she has been annoyed with an overpowering desire to sleep. When not actively engaged it requires constant effort to keep awake. The habit seems to be increasing and is a source of annoyance and embarrassment.

It is not our intention to enter into a detailed discussion of the surgery of the spleen, but propose simply to supplement the above report with a few general comments.

Although practically a modern operation, splenectomy has a history which runs far back into the centuries.

Dionis (1733), quoted by Greig Smith, speaks condemningly of a sect of surgeons who achieved notoriety, about the close of the seventeenth century, from their operations of "unmilting," as removal of the spleen or milt was termed. The only successful total extirpations for disease recorded previous to 1867 were those of Zaccarelli (1549) and Ferrerius (1711), both of which have been discredited, probably erroneously, by many authors. In nearly all of the statisti cal tables, Dr. G. Volney Dorsey, formerly a distinguished member of this society and an accomplished scholar and surgeon, is credited with a successful splenectomy made in 1855. Ledderhose refers to this case as the first authenticated successful laparo-splenectomy on record. A refer-

ence to the original publication,* for which I am indebted to Dr. Billings, United States Army Medical Library, shows that Dr. Dorsey, in this very creditable pioneer effort in splenic surgery, did not remove the spleen, nor is there any evidence that he ever entertained such a proposition. The operation was undertaken for the relief of pain in an enlarged spleen of malarial origin. On opening the abdomen extensive adhesions were found and treated as the source of trouble. "I then proceeded," says the operator, "to break up all the adhesions of the spleen, and endeavored to place this viscus as nearly as possible in what I conceived to be its natural position." The introduction of splenectomy into modern surgery dates from the memorable case of Péan, who in 1867 successfully removed from a young woman an enlarged and cystic spleen. Since then the operation has not only been accorded a place in legitimate surgery, but has been extensively practiced with fair success, though the mortality rate is still higher than in laparotomy for any other cause.

The indications for splenectomy have not been definitely settled. Taking as a basis the tables of Drs. Fussell,† Lederhose,‡ and Zuccarelli,§ and making the proper additions and corrections, we have the following summary, which fairly represents the conditions for which the operation has been made and the results attained up to date:

* *Ohio Medical Counsellor*, 1855.

† *University Medical Magazine*, September, 1890.

‡ Deutsche Chirurgie: Herausgegeben von Professor Billroth und Luecke, 1890.

§ Splenectomies in Italy: *American Medico-Surgical Bulletin*, May, 1894.

	Number.	Deaths.	Recoveries.	Percentage of Mortality.
Hypertrophy, simple: malarial	48	28	20	58⅓
Leucæmia.	27	26	1	
Pseudo-leucæmia	2	1	1	
Traumatism, no serious lesion of spleen	26	1	25	
Traumatism rupture of spleen	6	5	1	
Floating spleen	25	1	24	
Cysts of spleen, simple: hydatid	6	1	5	
Abscess of spleen	4	3	1	
Sarcoma of spleen	3	1	2	
Syphilis of spleen	1	0	1	
Amyloid disease of spleen	1	1	0	
Healthy spleen	1	0	1	
Total	150	68	82	45⅓

Like all statistical tables promiscuously gleaned from current literature, this one must be taken *cum grano salis*, since it is always a fair presumption that fatal cases are less likely than successful ones to find their way into print.

The celebrated case of Franzolini (1881), which however has not gone unchallenged, still remains the only successful splenectomy for leucæmia. With the exception of Bardenheur's case, which died from sepsis on the thirteenth day, none survived the operation longer than a few hours. Hemorrhage and shock was the cause of death in all but three cases.

There are a few writers (Fussell, Adlemann, Asch) who, in view of the hopelessness of medical treatment, still look with favor upon surgical procedures, provided the operation is made when the gland is only moderately enlarged, and before profound alterations have taken place in the blood. The consensus of opinion is, however, strongly opposed to this view.

The insidiousness of the onset of leucocythæmia and the extensive mutilation which splenectomy implies, taken in connection with the impossibility of eradicating the consti-

tutional cachexia which is back of the splenic enlargement, will certainly tend to confine "early operation" within narrow limits. So far, the ghastly record leaves unimpeached the dictum of Bryant, "that the operation is physiologically unsafe and surgically unsound."

The results in simple or non-leucæmic hypertrophy are more encouraging, although the mortality rate is still high, about 58⅓ per cent.

Agnew (1889) holds that all cases of hypertrophy, simple, malarial or leucæmic, are excluded from the realm of operative surgery. The latest text-book on surgery takes the more conservative position that, although hypertrophied spleens have been successfully removed, these cases are for the most part not suitable for operation.

These statements are hardly sustained by the facts. It is undoubtedly true that simple hypertrophy will rarely in itself be a sufficient justification for the performance of splenectomy; but in the presence of pressure symptoms, twisted pedicle leading to degenerative changes or disabling pain, all of which may be caused by a moderate enlargement of the gland, the operation is not only justifiable, but offers a reasonable probability of a favorable issue.

It is very apparent that the results are better in the later than in the earlier operations, due, probably, to a more thorough asepsis and an improved technique, and lead to the hope of better things yet to come. The record of the past decade in the operations for simple—including malarial—hypertrophy, shows twenty recoveries and eight deaths, a mortality of only 28⅔ per cent. against 58⅓ per cent. calculated upon the total operations.

In discussing this phase of the subject it is proper to take into consideration the brilliant results of extirpation for floating or displaced spleens.

In over fifty per cent. of these histories it is specifically stated that the spleen was enlarged, while in very few is it designated as normal in size. In many of the cases, as in

our own, the hypertrophy was extreme and gave rise to doubts as to their correct classification.

It is difficult to estimate from the imperfect data at hand the influence of malaria in causing the enlargement which led to the adoption of operative measures. It is only given as a cause of the hypertrophy in nineteen cases, of which five died and fourteen recovered. The condition of the blood, however, is a far more important factor in determining the issue in a given case than the amount or the nature of the hypertrophy (non-leucæmic). In any proposed excision of the spleen the blood should be subjected to a careful microscopical examination, and if the relations of the corpuscles are seriously disturbed, especially if the lymphatic glands are involved, operative procedures should not be undertaken.

Splenectomy for certain traumatisms of the spleen has a much better record than for disease. The results as displayed in the table, which includes both total and partial excisions, are very remarkable, and especially when the fact is recalled that almost all of the cases which enter into it antedate the dawn of aseptic surgery.

It is, however, worthy of more than passing mention, that in the recent literature of the subject there are recorded so few removals of the spleen for traumatic causes, and none for the peculiar traumatism with protrusion which gives the extraordinary results tabulated above. But unless interpreted in the light of the case histories, these figures would be manifestly misleading. The reports, so far as they are accessible, show that the above results were obtained when there was protrusion of the spleen through or into a parietal wound without serious injury to the gland itself or other viscera.

The graver injuries included under the head of traumatic rupture have necessarily a high mortality. It is fair to assume, from the deep-seated and protected location of the spleen, that when it has received an injury severe enough to

suggest splenectomy the concomitant lesions would be profound and probably fatal.

So far as we are able to ascertain, the case of Riegner* (1892) is thus far the only successful extirpation for a subcutaneous trauma of the spleen.

The intense surgical interest of this unique case prompts us to give a brief résumé. A lad, aged fourteen, fell from the third story of a house and struck on his belly. Twelve hours after the accident, signs of internal hemorrhage supervening, the abdomen was opened in the middle line; the incision was subsequently enlarged by right and left cross cuts. The spleen was found completely torn across at its middle, and the two sections widely separated. The spleen was removed, the abdominal cavity cleansed of large quantities of clotted blood, and the patient put to bed much exhausted. Convalescence was interrupted by gangrene of the foot and leg, which a few weeks later necessitated amputation through the left thigh. He recovered from both operations, and seven months later was in excellent health.

Ledderhose investigated the comparative merits of resection, extirpation and reposition of the protruding spleen, with the following result: Ten resections with ten recoveries; eighteen extirpations with eighteen recoveries, and four repositions with one recovery.

The conclusion seems irresistible that in prolapse of the spleen through an abdominal wound, extirpation, either partial or total, is a safer procedure than simple replacement. However, this deduction is less startling when we reflect that there is far less danger from sepsis and hemorrhage in a laparotomy, with its careful toilet of the peritoneum and better control of bleeding, than in blindly replacing the protruding organ. These statistics, contrary to the traditions of the text-books, warrant the statement that removal of the spleen is not in itself a highly dangerous operation, an opinion which is fortified by the brilliant

* *Berliner klinische Wochenschrift*, February, 1893.

results in the removal of floating spleens, already noticed, as well as by the fortunate ending of the case of Trendelenburg, in which he removed a healthy spleen in dissecting out a retro-peritoneal sarcoma.

Hemorrhage and shock constitute the great dangers in splenectomy, about seventy per cent. of the deaths being attributed to these accidents. Sepsis is largely eliminated by the promptness with which the fatal issue follows the operation. According to Mosler, the hemorrhagic diathesis so constantly associated with splenic enlargements, both simple and leucæmic, is often latent and therefore unsuspected before operative measures are begun. The pedicle is the most common seat of fatal hemorrhage; not infrequently it comes from the torn adhesions, and in a few cases has been attributed to a capillary oozing from the congested viscera. For greater security, some operators advise the separate ligation of the vessels of the pedicle in addition to the ordinary encircling ligature, but Treves states that no advantage has been shown to attend this practice.

The shock is often profound and, as in the case herein reported, is not easily explained. Traction upon the pedicle in manipulating the tumor has often brought on dangerous collapse, due probably to pressure upon the splenic nerve-plexus. It is not improbable that many deaths credited to post-operative collapse are really the result of a slow intra-abdominal bleeding.

The present position of splenectomy may be briefly epitomized as follows: It is unjustifiable in leucocythæmia or other conditions in which there is extensive involvement of the lymphatic glands, or a notable increase in the white blood-corpuscles.

It is indicated in tumors, simple hypertrophies, and other splenic enlargements which have proven rebellious to simpler measures and are attended with danger or serious disability.

In movable or displaced spleens requiring interference, extirpation is preferable to operative fixation.

Severe traumatisms of the spleen, with or without an external wound, or simple prolapse of the gland into a parietal wound, demand, as a rule, immediate extirpation. In cases of protrusion experience shows that excision, partial or total, is a safer procedure than mere replacement.

Removal of the spleen for cystic disease has an excellent record, but most authors advise a preliminary trial of incision with drainage. In abscess it is better, except in rare cases, to incise and drain than to attempt removal of the organ.

NEPHRECTOMY FOR TUBERCULOSIS.

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It is but a few decades since the average practitioner looked upon tuberculosis as a disease of the pulmonary organs alone. But more recent investigations have shown that there is not an organ or structure in the human economy that may not be affected by this dreaded and invincible disease.

The clinics of our hospitals are filled with tubercular patients, supplying clinical material for the oculist, the aurist, the laryngologist, the rhinologist, the dermatologist, the pulmonary specialist, the laparotomist, the general practitioner and the general surgeon.

Whilst whole volumes have been written upon the various phases of tuberculosis, yet we find that the literature of tuberculosis of the kidney is comparatively meager. Volumes have been written on albuminuria, glycosuria, hydrophrosis and pyelonephrosis, whilst tuberculosis of the kidney has been merely hinted at as a probability or possibility, and occasionally a clinical fact. Senn, in his syllabus, says: "Pyelonephritis, plus evidence of tubercular disease, may be a symptom of tuberculosis of the kidney." He also states that "the kidney may not be enlarged," and advises "microscopical and bacteriological examination of the urine." He says "the prognosis is always unfavorable," and in the

treatment of these cases, advises "only palliative treatment in *advanced* cases, but in *primary* cases nephrectomy and nephrotomy when the other kidney is healthy."

The American Text-Book says: "Tuberculosis of the kidney usually occurs in broken-down persons of middle age or younger," but says further that there is no important clinical or pathological distinction between the variety of tuberculosis which may occur in either one or both kidneys. Clinical experience, however, goes to show that the miliary form of tuberculosis is more apt to affect both kidneys, and as a consequence reveals an intense degree of constitutional infection. Clinical experience has also taught us that the localized form of tuberculosis, more commonly known as pyelonephritis, is more liable to be confined to one kidney, but at the same time it may be the result of secondary infection, the consequence of tuberculosis at some other point in the economy.

The author does not dwell on either the symptoms or the differential diagnosis, but announces that the prognosis is unfavorable and advises only palliative treatment in the advanced disease. Nephrotomy in the early stages, and nephrectomy where a nephrotomy will not suffice and only one kidney affected, is advised.

In excretory organs, whose duties it is to eliminate from the human economy certain effete matter, we can readily understand how easily they may become affected, especially where there is tuberculosis existing in the other parts of the system, also where tubercular bacilli are being eliminated through the kidney, in cases where tubercular foci had not yet been formed.

The proneness of the kidney to become ulcerated from the presence of calculi is also conducive to the formation of tubercular colonies in persons who otherwise might not have been affected with tuberculosis, as well as those who may be suffering from tubercular infection of other parts of the economy. It is easy to understand with our present knowledge of the regenerative process of the human

economy that any disease, tubercular or otherwise, that reduces the vitality, impairs the phagocytic resistance of the economy and conduces to the formation and development of tubercular foci.

SYMPTOMS.

It is plainly observed in our clinical experience that the objective and subjective symptoms of tuberculosis of the kidney are very much the same as those of other diseases that may affect either the hylus or parenchyma of the nephritic organs. Either one may produce pain in the back and distress over the region of the kidney. Either one may affect the functions of the kidney, whilst neither one may change the urinary secretions. For instance, if we have a tubercular focus that is encapsulated in the parenchyma of the kidney, the function of the kidney may be interfered with, yet there may be no material change in the character of the urine itself.

On the other hand, if we have a simple abscess involving a portion of the parenchyma of the kidney, which is also encapsulated by a pyogenic membrane, it too may interfere with the function of the kidney and yet not materially change the character of the urinary secretions. Yet we all know that the contents on the one hand would be decidedly different from the contents on the other, unless we had a case of mixed infection, where we might have pus and tubercular liquid confined in the same cavity.

I am frank to say that I have been utterly unable to separate the objective symptoms of tuberculosis of the kidney from those of other diseases affecting the kidney in a similar manner. I am inclined to believe that with the present knowledge of the clinical history of these cases it is quite impractical to discriminate the symptoms of the one from that of the other, unless there is general tuberculosis, with the peculiar cachexia and the emaciated appearance which sooner or later associates itself with a case of general tuberculosis.

DIAGNOSIS.

The diagnosis of tuberculosis of the kidney may be easy or difficult, according to the circumstances. For example, if we have a tubercular nidus which has free access to the urinary secretions, then we may expect on examination of the urine to find tubercular bacilli without the least difficulty. On the other hand if it is simply a pus abscess we would only find pus microbes, and the tubercular bacilli would be absent.

In order to settle the question as to whether the disease has extended to both kidneys or not, can be readily ascertained by catheterizing the ureters, and thus enable you to collect the urinary secretions from each kidney and subject each to a bacteriological examination, which will readily determine whether one or both of the kidneys are affected.

PROGNOSIS.

Whilst clinical experience has led us to look upon all classes of tuberculosis as grave, yet at the same time we know that where tuberculosis is strictly local and the infection is confined to a single organ and that one or more foci are so located as to be susceptible of complete removal, that these cases do recover and may live out the ordinary expectancy of life. If on the other hand, when they are so located as to baffle all efforts at their removal, the prognosis under these circumstances is always grave.

TREATMENT.

The treatment of advanced tuberculosis of both kidneys could be none other than palliative, for death under these circumstances would be an inevitable sequel. Whilst we have little confidence in the propriety of nephrotomy in tubercular kidney, yet, where both organs are affected, it becomes the only alternative, if we attempt any surgical interference whatever.

We can readily understand if there were tubercular foci in both kidneys and that the foci in each organ were still localized that it would be good treatment, and in fact the only reliable treatment outside of nephrectomy we could offer, to perform a nephrotomy and if possible remove the infected foci with a view of saving the patient's life and as much of the kidney as possible. This, however, should not be done simultaneously, as we consider the double simultaneous operation too great to be tolerated with safety. Under these circumstances we would advise an operation on the one kidney, and as soon as recovery was had from that, to be followed with a similar operation on the other. A nephrotomy might be advisable even where only one kidney is affected, if we were positive that there were but one or two tubercular colonies which we could beyond doubt remove. If, however, we perform a nephrotomy and fail to remove all the foci, our operation would then be in vain and there would be nothing left but a nephrectomy. However, I can readily appreciate the grounds taken by some operators who prefer to perform a nephrotomy and resort to a nephrectomy subsequently if they are compelled to, and whilst I always admire conservative surgery, yet at the same time I feel that unless you are absolutely certain of safety that it is a dangerous thing to trifle with such a formidable enemy, when a nephrectomy performed in time may, and usually does, save the patient's life and prevent the danger of multiple infection.

In performing a nephrectomy for tuberculosis the outline of the tumor is not always easily defined, and especially in the advanced stages, when the kidney has undergone degeneration, until there is little left on the one hand, or an enormous cyst wall filled with tubercular liquid on the other. I have seen these cysts ranging from the size of a small cocoanut to that of a gallon crock. Again I have seen the kidney destroyed until it was almost beyond discovery or recognition. I have seen them filled with purely tubercular liquid, and again I have seen them where mixed infection had taken place and the tubercular liquid was

mixed with pus, blood and urine. Under these circumstances it becomes exceedingly important that the operator guard against rupturing the cyst and thus spreading the infection which up to the time of the operation has been confined within the cyst wall, which should be removed *en masse*, if possible. Otherwise the patient takes great chances of having the infection spread, and the consequent return of the disease.

CONCLUSIONS.

Clinical experience has taught me to believe that where tuberculosis is confined to one kidney, that a nephrectomy is a safer procedure even in the early stages than nephrotomy. In the average cases of this class of diseases, where both kidneys are affected, nephrotomy may be performed, but not on both kidneys at once. Better on the one that is most affected first, and if recovery is not obtained, follow with nephrectomy. If the operation for nephrotomy is successful it may be advisable to perform it on the other kidney, but should the first one require nephrectomy, further operative interference would be absolutely unadvisable. When both kidneys are affected operative interference is always surrounded with a halo of doubt, and when resorted to at all, it should always be undertaken "with care and caution."

NOTE.—Since writing this paper my confidence was shaken more than ever in the value of nephrotomy in tuberculosis. Through the courtesy of Prof. Baldwin, I was recently invited to witness a post-mortem on the remains of a young lady, on whom some four nephrotomies had been performed during the last four years of her life. The post-mortem revealed almost the complete destruction of the left kidney from tuberculosis associated with a perinephritic abscess, which had pointed in the groin and some months prior to death had been opened and of course re-

mained patulous. This connected with the lumbar opening made when the nephrotomies were performed, had never closed. With the exception of a few miliary tubercles at the apex of each lung which had not yet broken down, the visceral organs were all healthy. Evidently in this case a young life had been sacrificed by depending on repeated nephrotomies which, we have every reason to believe, might have been saved by an early nephrectomy.—AUTHOR.

SUBCUTANEOUS OSTEOTOMY.

WITH REPORT OF CASES. — A NEW OSTEOTOME.

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Osteotomy in its literal sense means section of bone; in its surgical sense or use it is more restricted, and is a term applied to such operations of bone-cutting as have been done for the relief of deformity, whether due to badly united fractures, bony anchylosis of joints, rachitis or other conditions causing bow-legs, knock-knee and so on. In my remarks I shall confine myself to the consideration of these latter cases only.

Section of the long bones for deformity had been proposed by some of the early writers on surgery, but it does not appear to have been put in practice until early in the present century. A great many operators have devised and executed many different operations with as many kinds of instruments for anchylosis of the hip with faulty position of the limb.

The special instrument for cutting the bone has ranged all the way from a chisel through ordinary saw, chain-saw, bone-drill, to the osteotome.

All these operations prior to 1852 were made through an open wound. In that year Langenbeck made a division of the femur for anchylosis of the hip-joint by perforating the bone with a bone-drill through a small wound in the soft parts, and then introducing a narrow saw completed the

section. He gave to this operation the name of subcutaneous osteotomy. This I take it was the starting-point for the more successful performance of a kind of surgery that had until this time been largely a failure.

Suppuration with its attendant evils were the great causes of failure, but with a more careful development of the subcutaneous plan of operating, together with carrying out in detail of the antiseptic principles, the operation made in the deformities of knock-knee and bow-legs is firmly established, and so almost uniformly successful as to be justifiable under ordinary circumstances where at all indicated.

GENU VALGUM.

This is a deformity at the knee-joint in which a line drawn from the head of the femur to the middle of the ankle-joint passes outside the centre of the knee-joint, and in which the internal malleoli cannot be made to touch when the limbs are in an extended position.

OPERATION.

The earlier operations for this deformity were made by section of the bones below the knee, and then with a closer study showing that the inner condyle of the femur was on a lower plane than the outer one came the Ogston operation of separating the inner condyle and sliding it up until the condyles were on the same plane. The instrument used for dividing the bone, a narrow saw with a long shank. The Ogston operation was fairly successful, and I am strongly inclined to think that by the use of a specially narrow and thin osteotome with the present perfection of aseptic surgery it could be made to advantage in many of these cases.

The operation above the condyles is the one that has been most successful. The patient having been anæsthetized Esmarch's bandage is applied, extending well upon the thigh so as to be entirely out of the way during the operation.

CASE I. BERTHA E. T.

The leg is flexed upon the thigh and the thigh rotated outward, so as to give easy access to the inner portion just above the knee. The limb is laid on a small sand-pillow which has been molded so as to give a good bed to the limb

CASE I. BERTHA E. T.

opposite the seat of operation. An incision is then made down on the ridge of bone running from the tubercle for the attachment of the tendon of the adductor magnus to the linea aspera at a point one inch above a line drawn inward

from the lip of the external condyle. The scalpel should be a small one, avoiding an incision larger than necessary to admit the osteotome. The incision should be parallel with the long axis of the limb, and the knife kept in position while the osteotome is passed down on it as a guide, and when on the ridge of bone the knife is withdrawn and the osteotome rotated so that the cutting edge is at a right angle to the line of incision. It is better to begin the section here, directing the osteotome outward and forward, for by so doing the inner and posterior lateral portions of the femur are divided first and the cutting edge of the instrument is directed away from the large vessels. If the osteotome becomes wedged it should be replaced by the next thinner. When it is judged that the larger portion of the bone has been divided and that it can be fractured through, the osteotome is withdrawn, the wound covered by a pad of carbolized gauze, then grasping the limb above and below point of section the remaining portion of the femur is fractured.

The oozing of blood should be but slight. The wound should be dressed by very carefully snipping away with curved scissors any adipose or other tissue that may lie as a hindrance to the nice coaptation of the integument. And I would like to especially emphasize this point, for I think the failure to get immediate union of the skin is the cause of more failures than all others put together, if asepsis is carefully practiced.

A strip of adhesive plaster should be used to bring the skin together. This strip would best be a little narrower than the length of the incision, that it may not prevent any oozing of blood, which if prevented would cause tension of the parts. The region is now dusted over with aristol or iodoform, and over this a pad of gauze three by three inches and four layers thick. A flannel bandage extending from the toes to well above the section, and over this a plaster of Paris dressing. The limb should be at once placed in the proper position, which is that of a little over correction, and so held until the plaster hardens. On the following day

the dressing will be found blood-stained for an area of about three by four inches, but it is of no consequence and needs no attention. On the third day a fenestrum about two by two inches should be cut over the seat of the incision, the compress of gauze removed, and the wound examined. The square pieces can be easily lifted out, but it is better if the wound looks well not to disturb the strip of adhesive plaster. If the wound is not doing well, ordinary surgical dressing of it as indicated at the time should be practiced daily.

GENU VARUM, OR BOW-LEGS.

In the operation for this the same general principles hold. The point of section should be that of the greatest angularity. The fibula should be divided first, and for the tibia a counter-opening made for drainage of the blood that would otherwise cause overmuch tension. The best drain is afforded by inserting fifteen to twenty horsehairs previously made aseptic. They should be drawn into the wound, and left projecting from the posterior wound only. These can be drawn away one at a time without causing any pain on the third day. The direction of the osteotome is important here also. By making the section of the tibia with the osteotome directed backwards and inwards as much as possible the tibial arteries are least likely to be injured. In putting up the leg in the plaster dressing there may be undue pressure upon the skin by the ends of the divided tibia, owing to the bones lying with so little fleshy covering. In one case I only partially corrected the deformity the day of operation, and redressed the leg entire when there was a provisional callus on the tenth day. By this plan I was able to avoid damage to the overlying skin, and at the same time get as good correction and result as one could ask.

By this method, which is known as subcutaneous linear osteotomy, the conditions, while in theory they resemble compound fracture, it is in theory only. It is true air may be

admitted to the severed bone and probably is in most cases, yet there is not the damage to the soft parts that almost always occurs in ordinary compound fracture, to say nothing of dirt, such as cinders from the railroad track and grease and dirt from machinery of the shop, the two places from which the larger part of compound fractures comes to us.

In hands trained to the details of antiseptic surgery these osteotomy wounds should be of but little more danger than ordinary simple fracture of the same bones in the same locality, and I can see no reason why any surgeon with head and hands trained so as to make and heal wounds in an aseptic or proper surgical manner should not operate successfully upon these cases of bow-legs and knock-knee, and thus restore to usefulness many of these little people otherwise condemned to be a burden upon their friends and the community in which they live.

CASES.

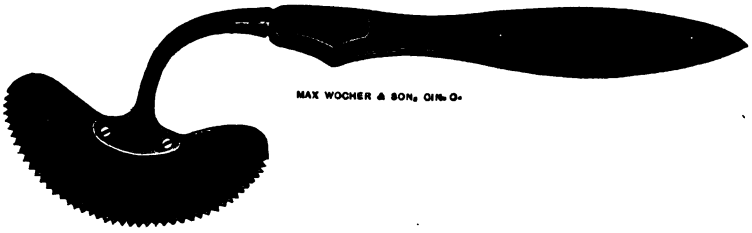
No. 1. Bertha E. T. (colored), Springfield, O., age five years; made a supracondyloid linear osteotomy of right femur May 5th, left femur May 16th, 1890. The photographs show the condition before and after operation, the one after being taken June 10th, twenty-five days after the operation on the left and thirty-five after that on the right femur. Motion of the joints perfect and scarcely a trace of a scar in the skin.

No. 2. Carry P., Minneapolis, age three years, condition and operation almost exactly like No. 1, with like good results.

No. 3. Arnold S., Springfield, O., age four years, bow-legs. The tibia and fibula in both legs much curved, the points of greatest curvature about four inches above the ankle-joint.

In all these cases, which include all upon which I have operated, and making a total of four of section above the knee and two below, there was immediate union of the

soft parts and rapid and firm union of the bone, no pus appeared in any of them, in none was the temperature above 99 degrees.



INSTRUMENTS.

I now use an osteotome which I have had made. It is shorter than those generally used, and on this account I think it is better under the control of the operator. The mallet for driving the osteotome is of lignum vitæ with hard-wood handle and weighs twelve ounces. For making the fenestrum and removing the plaster dressing I use this small saw, devised by Dr. Rufus B. Hall while he was in general practice.

FRACTURE OF THE EXTERNAL CONDYLE OF THE HUMERUS.

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Fracture of the external condyle most commonly, indeed almost invariably, occurs below the age of sixteen. Personally, except as the result of crushing wounds, I have never seen it but in children under seven years of age.

It is difficult in young children to ascertain the exact mode of its occurrence, as they are usually unable to give a definite history of the accident. It is probable, however, that the majority of cases occur from a fall upon the elbow, though in some cases it is certainly caused by a fall upon the hand, the force being transmitted through the olecranon, which is driven upward and outward, carrying with it the head of the radius and the external condyle. In the less serious forms of this injury the periosteum is but slightly torn, the amount of displacement being thus limited by its attachments. In these milder forms of injury the external lateral ligament exercises some influence in maintaining the fragment in its natural place, though owing to its comparative insignificance in size and attachment, its resistance is scarcely to be taken into consideration. In the more serious forms of this injury, where the ulna retains its position, it is probable that this ligament exercises considerable influence in maintaining the fragment in place and preserving the topographical relations of the joint.

The line of fracture, beginning at the outer ridge of the humerus, runs obliquely downward and inward to the joint, either through the surface articulating with the head of the radius, or into the trochlea, in which latter case the olecranon process of the ulna is likely to be displaced along with the head of the radius, making a complexus of symptoms that may lead to a faulty diagnosis of a simple dislocation of these bones; the more serious trouble, that is, the fracture, being entirely overlooked.

The displacement of the fragment may take place in any direction except inwardly. The natural tendency of the extensor and supinator muscles, as well as of the lateral ligament, is to prevent its upward displacement, and yet it not infrequently occurs. It is somewhat difficult to understand how this upward displacement can often be so marked and persistent, and I can only account for it upon the supposition that the attachment of the extensor muscles has been broken off. I have observed this to happen in a case of compound dislocation of the humerus in which a small fragment of both internal and external condyles with the attached flexor and extensor muscles were stripped from the condyles.

When the lower end of the condyle remains fixed there is, especially in extension, a tendency for the upper end of the fragment to tilt forward, making an easily discernible prominence on the anterior surface of the bend of the elbow; a prominence not always easy to overcome, and which may persist after repair and restoration of function are complete.

The diagnosis of this injury is of so great importance, particularly in rendering a prognosis, that few cases will present themselves in which it will not be advisable to administer an anæsthetic. The close resemblance in outline which it sometimes bears to a posterior dislocation of the ulna and radius, combined with the rapid swelling which often occurs, makes such an examination almost imperative,

for without it the surgeon might easily be misled into giving a prognosis based upon a supposition that it was only a dislocation, which might prove a costly error to take care of when it was found later that the elbow was nearly stiff and that an exuberant callus had made its appearance at the site of injury. With an anæsthetic, even in very severe injuries of the elbow-joint, the exact nature of the lesion is ordinarily quite readily made out.

It is important that there should be some uniformity of opinion as to the prognosis to be given in these cases, for I am strongly of the opinion that the physician should not only take care of his patient but of himself, and if he be led into giving an unqualifiedly favorable prognosis by the brilliant results sometimes reported in the treatment of these cases, he may regret that he was not also familiar with the fact that nearly every surgical authority agrees that fractures involving the elbow-joint are peculiarly liable to be followed by severe inflammation, anchylosis and deformity. Even in the more simple form of these injuries, when the treatment is most skillfully conducted, there is generally great risk of an unfavorable result.* It is true that one writer † has reported seventy cases of this injury, all of which under one line of treatment, fixation in a straight position, recovered with a complete restoration of function, and another ‡ reports forty cases, all dressed in a plaster bandage in a flexed position, with almost all restored completely in form and function; yet such results have not been obtained under the careful treatment of Gross and Agnew and Hamilton and Stimson.

There is such a vast difference in the treatments which produce such good results, that we must conclude that it is not upon any one form of splint that we must rely, but

* Gross.

† Berthomier.

‡ Powers.

rather upon the good judgment of the physician in using that form which suits the case.

It has seemed to me that the efficient treatment of fractures of all kinds has been greatly hampered by the repeated attempts that have been made to lay down dogmatic rules as to position, splints, etc., to be used in given cases. There is one prime indication to be met in every fracture, and that is to hold the fragments in position after reducing these to their places. It is not necessary to have a special method of dressing the fracture. If a posterior splint best holds the fragments to their place, by all means use a posterior splint; or if an anterior, external or internal lateral splint best holds them there, then that one should be used. *No preconceived notion should impel one to use a certain splint when another will better fulfill the indications mentioned.* These rules apply to all fractures, and especially to the one under consideration. First reduce the fragment, if possible, to its proper position, and then hold it there. It is not wise to dress them all at a right angle, nor all in the extended position; neither should a posterior angular splint be preferred to the exclusion of an anterior one, an internal lateral to an external lateral; rather should that splint be applied which best holds it in position, and the fact that the fragment may be displaced in any position except inwardly, should make it apparent that no one form of splint is invariably indicated.

There is another part of the treatment that I consider of even greater importance than the nature of the splint: I refer to the passive motion. Here we find a great difference of opinion as to the proper method to be pursued. It seems reasonable to presume that some cases, at least, will present such a severe injury not only to the bone but to the soft parts, that early passive motion may not safely be employed, but from a careful compilation of the results obtained by many who resort to it, and to the excellent results which it has accorded me, I am strongly of the opinion that the vast majority make more perfect recovery, especially as to func-

tion, than those in which long-continued fixation is resorted to. My own practice has been to begin passive motion as early as the fourth or fifth day, unless severe injury and inflammation be present. I have most frequently made use of the anterior angular splint with a short posterior splint for the arm, believing that with this splint I can accomplish not a little with a carefully applied roller bandage, and possibly a slight compress toward maintaining the normal relation of the parts about the elbow-joint. Beginning at from the seventh to the tenth day, I gradually, at each dressing, alter the angle of the splint until a straight position is attained, and then reverse the procedure until the rectangular splint is again used. This is persisted in until from two and a half to three and a half weeks, when all splints are removed and daily passive and tentative active motion may be reverted to. By these means I have thus far invariably succeeded in obtaining excellent if not perfect motion, though I have seen exuberant callus with abnormal prominence of the upper end of the fragment persisting after a year had elapsed in one case, and a lessening of the outward deflection of the forearm, due, no doubt, to a downward displacement of the fragment, in another. I am not unmindful of the words of Gross as to anchylosis and deformity, and this opinion is shared by a great many writers, and I feel that we are justified in refusing to give in these cases a prognosis of perfect recovery either of function or shape.

If I may briefly recapitulate the contents of this paper, I will say:

First: Fractures of the external condyle are confined almost exclusively to children, and are usually the result of direct injuries.

Second: Displacement of the fragment may take place in any direction except inward, and is sometimes accompanied by a dislocation of the radius and ulna.

Third: That while good motion may generally be anticipated, anchylosis, either partial or complete, is of frequent occurrence.

Fourth: An unusual prominence of the upper end of the fragment, widening of the joint, increase or decrease of the carrying angle of the forearm, may result under any treatment.

Fifth: No dogmatic line of treatment should be insisted upon.

Sixth: Early passive motion should be resorted to.

Seventh: The prudent surgeon will at once inform his patient or his patient's parents of the nature and probable consequence of the case, and refuse to promise them under any consideration that a perfect result will occur.

SOME PRACTICAL POINTS IN ETHER-ANÆSTHESIA.

W. D. Porter, M. D., Cincinnati.

It is not the purpose of this paper to discuss the mooted question as to whether choloform or ether is the better anæsthetic. Nor is it the intention to discuss the entire subject of anæsthesia by ether and to review the extensive literature pertaining thereto. The object is to bring up for consideration and discussion a few practical points, selected mainly from the personal experience of the writer.

In the beginning I wish to devote a moment to the Trendelenburg position, in so far as it bears on the danger or safety of the anæsthetic. It is a resort of so much value in some cases of abdominal and pelvic surgery that it will be permanently adopted for those particular operations. It is well, therefore, to consider in what manner the phenomena of anæsthesia are modified by the position. At first thought it might seem to be the ideal position. Prompt lowering of the head is one of the measures generally recommended in treating cases in which dangerous shock results from the anæsthetic. But it is one thing to use the position temporarily to supply blood to the nerve-centres, and quite another thing to adopt the position throughout the operation. The experiments of Hare on the rabbit are instructive in this connection. When the anæsthetized rabbit is placed in a position simulating the Trendelenburg, there is such marked respiratory failure that death soon follows. This is due to the pressure of the abdominal contents on the

diaphragm. We do not get such effects in man, probably because his abdominal organs are relatively small, and because his thorax is not nearly so conical as that of the rabbit. Still, it is well to watch the action of the diaphragm with unusual care when the patient is in this position. My experience leads me to believe that the position entails but slight additional dangers, provided the table be properly constructed. As usually constructed, the middle portion is so arranged that it can be raised into a double inclined plane. One plane supports the legs of the patient and the other supports the thighs and body, while the head rests on the horizontal portion of the table, thus forcing the shoulders into the angle and flexing the head on the chest.

I have seen dangerous interference with the respiration result from this faulty position. The thighs, body and head should rest on a single inclined plane, which should be about four feet in length. In this posture the head assumes a position of slight extension, thus facilitating respiration. The body should be prevented from slipping down the incline, by securing the legs or feet. The plan of using hooks, against which the shoulders rest, is a mistake, as they interfere with the free action of the chest-muscles.

Coming now to the administration of ether we at once meet with an objectionable feature that cannot be entirely eliminated, viz., the disagreeable sensations of the patient, which usually begin with the first inhalation and continue up to the point where consciousness is lost. These sensations are due to two factors. The irritation to throat and larynx is caused directly by the ether vapor. The sense of impending suffocation is due to an asphyxial element caused either by holding the breath or by breathing the same air over and over again, or by both.

There is great diversity of opinion as to the time which should be consumed in producing full anæsthesia. Appliances have been used for insuring such rapid generation of ether vapor that complete narcosis results in one or two minutes. This procedure is clearly dangerous. Reeves has

demonstrated that if pure ether vapor, in large quantity, be carried into the lungs of a dog by means of a tracheal tube, death promptly follows from failure of the heart.

Another method for producing very rapid anæsthesia is that of causing partial asphyxiation by the almost total exclusion of fresh air. This is a popular method. It is the one generally recommended in Germany, where ether now bids fair to divide the honors with chloroform. The advocates of this plan claim that it is free from danger. It has the advantage of consuming only a small quantity of ether. It has the disadvantage of causing, as a rule, extreme distress to the patient.

By adopting five or six minutes as the average time for complete anæsthesia, the patient suffers little discomfort, provided that up to about the point where consciousness is lost the open method be used, and the ether vapor be added to the inspired air in a gradual and uniform manner. After many carefully timed observations, supplemented by subsequent inquiry as to the sensations experienced by the patient, I have adopted this rule:

The amount of ether inhaled is increased from zero up to the full quantity in a period of three or four minutes. After reaching this point about two additional minutes are required. I prefer to use the Clover Inhaler, and in the following manner:

The indicator in the beginning points, of course, to zero. After a few inhalations of air the indicator is moved to allow a slight admixture of ether vapor. Many such additional quantities are liberated at short but uniform intervals, until the indicator points to F, which means that all the inspired air passes through the ether chamber. If the ether is turned on in this slow and even manner it arouses no resistance on part of the patient, and with a little encouragement his breathing will be full and regular. As already intimated, about three or four minutes are consumed in this gradual increase of the anæsthetic. Consciousness is almost abolished, and the rubber bag is now inflated and applied for the re-

maining two, or two and a half minutes which intervene until anæthesia is complete. After this point I discard the bag altogether.

While I regard the Clover Inhaler as valuable in producing anæsthesia, I consider it far superior to all other appliances for maintaining anæsthesia. This brings us to one of the most important features of the subject. The patient is now anæsthetized and the problem is how best and most safely to prolong this condition during the operation. Here it is that the greatest blunders are made; many times through ignorance, often from lack of skill and judgment.

The ideal plan is to select the proper level for the anæsthesia, and to constantly endeavor to keep the vacillations which necessarily recur above and below this plane, within the shortest possible limits.

The farther the departure from this plan, the more dangerous it is to the patient and the more disturbing to the operator. Everyone has observed instances in which the ether is pushed to profound anæsthesia; then fresh air with no ether is allowed until slight resistance is noted, when the ether is again pushed almost to the danger line. At one time the breathing is labored and stertorous to an alarming degree, and again the ether is withheld so long that vomiting may ensue, and the patient sometimes so far rallies as to make it necessary for him to be restrained until anæsthesia is again rendered complete. The surgeon is annoyed, now by the resistance of the patient, and now by the unnecessarily deep narcosis. The operation is prolonged and the amount of ether consumed is largely increased, thereby incurring unnecessary dangers during the operation, and delaying the reaction afterwards.

Fortunately it is seldom that the method is so vicious as this. But it is equally seldom that sufficient effort is made to keep the anæsthesia at a constant level by continuous and carefully graduated inhalations of ether. Given in this continuous manner, the quantity of ether necessary to maintain anæsthesia is surprisingly small, and it becomes less the

farther the anæsthesia is prolonged. In this connection it is well to remember that the reduction of bodily temperature which always accompanies the use of ether, has been proven by Kapeller to vary directly with the depth of anæsthesia and the amount of ether inhaled.

In desperate operations, undertaken with the idea of giving the patient the only chance of life, I believe that the result often depends as much on the careful and economical administration of the ether as upon the celerity and dexterity of the operator.

There is a very important factor bearing on the quantity of ether consumed which is entirely beyond the control of the anæsthetizer, viz.: the duration of the operation. Anæsthesia has destroyed the necessity for the rapid and ofttimes over-hasty surgery of former times; but it has not created an excuse for the extremely deliberative and even leisurely methods sometimes adopted. Cases occur in which the patient might be able to endure anæsthesia of a half-hour, but would succumb if the time were extended fifty or a hundred per cent. Too often in fatal cases the exciting cause might be truthfully written, "prolonged anæsthesia."

But let us drop this digression and resume the consideration of maintaining the anæsthesia at a constant level. The chief indications as to the depth of anæsthesia are the conjunctival reflex, the degree of muscular relaxation and the character of the respirations. As the changes in these symptoms indicate that the anæsthesia is slightly insufficient or a little greater than necessary, the skillful anæsthetist promptly increases or decreases by a slight amount the quantity of ether inhaled.

Now if the problem is complicated by the impossibility of knowing at any moment the ratio of ether-vapor inhaled and by inability to change the ratio promptly, the solution can only be approximate. In other words, handicapped by this lack of precision, the anæsthetizer is compelled to adopt a deeper level as his standard and to allow greater vacillations above and below this level. The chief value of the Clover

Inhaler is in the accurate control which it gives its manipulator over the amount of ether inhaled and the readiness with which it admits of changes in the quantity. Incidentally the ether chamber is so constructed that the surface of vaporization is constant, whether it contains little or much ether; consequently in a constant temperature the rate of evaporation is uniform. My object in dispensing with the rubber bag is to avoid rebreathing of air. Buxton, one of the best authorities, strongly urges the superiority of this inhaler. He seeks to avoid the danger of the asphyxial element by entirely removing the inhaler every fifth or sixth inhalation. One of the strongest claims made for the bag is that by furnishing warm air to the patient it lessens the danger to the lungs. This danger is equally well averted by keeping the air of the room warm. In fact, unless the room is warm, the evaporation is not sufficiently rapid to keep the patient properly anæsthetized without the use of the bag.

In the next place I would call attention to a symptom which I always regard with apprehension. There is a point in the induction of ether narcosis at which there is generally some muscular rigidity. This rigidity is, as a rule, but temporary. Occasionally it becomes intense and persists after the abolishment of the corneal reflex. It is unnecessary to say that this is a condition of real danger, but in several instances I have seen a still more dangerous condition supervene. I have seen three cases in which death seemed imminent, and in each case this condition of rigidity was followed by extreme muscular flaccidity and dangerous respiratory failure. Probably this was due to some peculiar effect of the ether on the muscle-fibres, causing over-stimulation, followed by extreme relaxation. Three cases are too few to justify reliable conclusions, and the supposed relation of cause and effect may have been merely coincidence.

The final consideration is the importance of having a hot room in which to administer ether. The statement has

been made that the inhalation of ether always tends to lower the temperature of the body. Let us for a moment consider the factors which cause lowering of temperature.

The muscular system of the patient is at rest. It is often impossible for him to be more than thinly clad, and moreover a considerable portion of his surface may be moistened with water or other fluid and its evaporation chills him. If he were not anæsthetized he would require, under these circumstances, a temperature of about 80° F. to make him comfortable. Other factors come into play when the ether is administered. Its first effect is to stimulate the circulation and drive an unusually large quantity of blood into the skin. This means rapid radiation of heat. Often the surface is bathed in perspiration, causing evaporation, which still further abstracts heat. The evaporation of the ether reduces the inspired air to a low temperature. So we have unusual forces abstracting heat, not only from the surface of the body but also from the interior—even from the blood current itself. On the other hand, the economy is still further embarrassed by diminished oxidation.

The lowering of temperature has a threefold bearing, increasing the danger of shock, increasing the danger to the lungs, and increasing the danger to the kidneys. Tait records an observation made years ago showing the effect of ether on the kidneys. The case was one of urinary fistula, in which a ureter had become embedded in the cervix. From a point on the infravaginal portion of the cervix, the urine could be seen dropping as it was emptied from the ureter. The patient was anæsthetized by ether in order that the fistula might be closed. After full anæsthesia, when the operator was about to proceed, he was unable to find the fistulous opening, as the urine had ceased to drop. After several days the attempt was again made with the same result. A third time the attempt was made, using chloroform as the anæsthetic, when he had no trouble. It is a common observation that little urine is excreted for some hours after ether narcosis, though the blood pressure is often increased.

Of course ether should not be administered to one who has diseased kidneys. And it is well to be certain not only that the kidneys are sound, but also that they are doing their work well. A few days' delay to get the kidneys in good working order by the use of diuretics is often a matter of importance, but it is generally overlooked.

The danger of bronchitis is owing to the tendency of the cold vapor to freeze the lungs. This danger can be largely averted by having the air of the room sufficiently warm. It is also dangerous to the lungs for the patient to be placed in a much cooler room immediately after the operation. The ether is eliminated largely through the lungs by evaporation from the blood stream. In this process heat is required. If the inspired air is not sufficiently warm the heat needed by the ether will be abstracted from the lungs.

The plan most generally adopted to secure warmth to the patient, is to apply heat in the form of hot water. This is not only inconvenient, but has the serious drawback of having the least utility when most needed. We must remember that the problem is really to lessen the abstraction of heat from the body. If we resort to hot water it is impossible to apply heat to more than a small area of the body. If the heat here is higher than that of the body, the blood current absorbs heat at this point and distributes it to other portions. As long as the circulation is good this process is well maintained. Indeed, it may be carried too far and produce heatstroke. But should a condition of shock arise, the circulation drops and there is little or no means of distributing the heat. At the very moment when it is indispensable it is not available. By supplying heat in the form of hot air, we have the patient enveloped in an even temperature and we furnish a constant supply of heat for the vaporization of the ether. By regulation of the heat in conformity with the needs of the particular case, I believe that we have the means of eliminating the two greatest dangers of ether, the danger to the lungs and the danger to the kidneys. By the aid of a hot atmosphere I have seen ether

used safely in cases of bronchitis; and I know that since adopting this method I have noticed decidedly more prompt reaction after the operation. The value of the plan was emphasized and forced on my notice as follows:

A woman was suffering from extra-uterine pregnancy. She had not consented to an operation until after the third occurrence of pain and syncope. The operation was undertaken while there was still some shock, and it was feared this condition would be dangerously increased. The day was cold and instructions had been given to keep the room well warmed. When the operation was begun the room had been heated to a high temperature, and as it was small it was thought unsafe to open the windows. The operation was concluded with considerable discomfort to the operator and assistants. Contrary to our apprehensions there was little shock, though free hemorrhage occurred during the operation. The idea at once arose that shock had been greatly lessened by the hot room.

I did not adopt this suggestion on the evidence of the single case, but have tested it since in several hundred cases, and have come to the conclusion that the hot room is indispensable to the safe administration of ether. The temperature should be from 80° to 90° F., depending on the condition of the patient and the nature of the operation.

THE VALUE OF RECENT THERAPEUTIC LITERATURE.

W. C. CHAPMAN, M. D., TOLEDO.

All literature is but recorded thought or knowledge. Medicine shares with art, poetry, philosophy, and fiction, and to the painstaking, careful investigator who has the gift of imparting to others that which he himself possesses, is due the noble stand which medicine has taken in this active ninteenth century. It is only necessary to go back a few years to see that in medicine, as in every other field of scientific research, the advancement has been great.

It is by the study of our literature that we expect to profit; upon our library shelves are stored the best thought of brilliant minds from every civilized nation under the sun, and to these works of labor we ever turn that we may benefit and confirm or reject a pet impression made upon our mind by perhaps limited experience. As a mine of gold ready to be developed is the unopened cover of many a medical classic.

The literature of our profession may be classified as general and special. As in medicine itself there is a tendency to specialism, so in its literature there has been a necessary classification, and everywhere there is marked endeavor to give that which is richest and best to all grades of student-life.

Most satisfactory has been the work of those who are able in their teachings to report upon facts deduced from investigation, so that one who attempts to prove the truth of as-

sertions made can do it by tangible demonstration. Thus anatomy is satisfactorily studied because the eye and touch convey to the mind the truthfulness of the teachings of its literature; so with chemistry, physics, physiology, and to a large degree pathology and histology. It is when we approach those studies in which theory to a great degree forms its literature, that our investigations and reading become unsatisfactory.

General medical practice itself presents little difficulty until we pass to the application of knowledge to the relief and cure of the patient. This, the supreme desire of medical study, becomes with the learned the most unsatisfactory and unreliable of all.

Beginning with the fundamental studies of anatomy and physiology, all through medical life the never-ending stream of thought pours through its literature a flood of knowledge, ever tending to increase the doctor's influence. Most voluminous of all is the literature of our therapeutics, and it is certain that nowhere is there more unsatisfactory study than in the attempt to reconcile the results of active practice with the reports made by those whom we consider authority. The experience of the practitioner is mainly so disappointing that all statements as to the results of treatment are received with suspicion, and it is only when the united testimony of many experiences gives unvarying results that we are able to use with confidence any line of therapeutic procedure.

The therapeutic literature of the past was neither voluminous or definite; that of the present is extraordinarily voluminous and perplexingly indefinite. The faith of the fathers has been supplanted by the uncertainty of the present generation. We are accustomed to pride ourselves that in the great work of prolonging life we have been successful beyond all that has gone before, and he who reads believes that we have learned to so combat sickness and death as to add much to the probable length of human life. Analyzing the totality of statements, do we really find that the

giving of medicines to the sick has been greatly more successful than was the medication of fifty years ago? Does therapeutic literature teach that more has been done with drugs than formerly? Does it not prove that the fear of overdoing has been more potent than the doing? In other words, has not the modern therapeutist learned from the enormous volume of his literature that uncertainty of action is more fully established than precision? The very number of remedies proposed by writers shows the unsatisfactory result of experience in use of the old ones. It is a common saying that the disease which is sought to be combated with the greatest variety of remedies, is the one which has never yet been successfully treated. An old professor once poured upon the lecture-table a half-bushel of pessaries from what he called his toy-shop, remarking, "I show you so many because none are satisfactory." So we in our literature endeavor to impress the desirability of a new remedy because after experience none of the old have been found really satisfactory.

Do not let me be understood as saying that the study of years has not brought with it expected benefit or good to the world. I do say that medicine has advanced with wondrous strides, but only because we have learned how not to give medicines rather than how to give them. The advance has been made in the understanding of causes of disease with means of prevention, rather than in the ability to combat by medication pathological processes aleady established. The conducting of a case of pneumonia through all of its self-limited stages without active drug administration, shows a far greater medical acumen than does the recovery of the patient in spite of heroic dosage. No greater advance was ever made in medicine than when it was shown that disease is in most cases self-limited, and that nature, with powers vastly more reliable and powerful than we can substitute, generally tends to cure.

I believe that the therapeutics of the future will be applied not to the sick man alone but also to his environment:

preventive medicine will more and more occupy the thoughts and investigations of the medical world, and in the great victories won in the prevention of the spread of contagion will be found the blessing of medicine to man.

Therapeutic literature is the medium by which is conveyed either theories or demonstrable facts. It has been said that theories are but guesses, and are worthy of acceptation only as they appeal to the reasoning powers of those who read. Any one may have a theory, and by collateral study and investigation fairly present his ideas so that many will accept them as plausible, and therefore worthy of belief. A thorough knowledge of fundamental truths leads to sound conclusions. A reasoning power must be based upon intimate knowledge of demonstrable facts. Ignorance often leads to false reasoning and therefore false conclusions.

The value of recent medical literature can only be determined in two ways: First, the author must be known as a skillful practitioner, and secondly, his writings must bear the impress of truthfulness, learning and common sense. Added to these must be the belief that the shop has nothing to do with the promulgation of views as to the value of any medicine or appliance.

Novelty never inspires faith; it is to the old, tried remedies that we turn in an emergency. There are some among us who seem to revel in the use of all new drugs, and are only happy when experimenting with recent additions to our altogether too long list of remedies. Others refuse to even study anything novel, preferring to cling to tradition rather than to literature, seeking no light from those capable of furnishing information worthy of acceptance.

Our authors must be widely known; by this I mean they must be those who have had ample opportunity, clinically or otherwise, to speak with authority to those they would instruct. All prominent men are not good observers, are not capable of noticing causes and effects. Many statements made of observed phenomena, when examined by the superior knowlege of broader minds, lead to diverse conclusions,

and further experience of the original investigator often compels a reversal of first statements.

Much of our recent literature is the result of observation too limited in time or extent. The result of administered medicines is often published before the full action or effect is noticeable. More often results are given when but few cases have been experimented upon. The worth of our most reliable remedies has been established after years of careful observation, administered under all circumstances to multitudes of patients. It was years before chloral hydrate or the bromides became established as valuable remedies. Therapeutic literature was crowded by reports of investigators, some ridiculously enthusiastic and others as markedly conservative. The salicylates are just fully accepted as worthy of employment by those more competent to observe their action. So might be mentioned others of more recent date. Just now literature is crowded with the wonders of the coal-tar derivatives. It seems as if the German laboratories were endeavoring to combine the elements into innumerable substances, and then hand them to the clinician to see if they cannot be found good for something. A name is coined, and they are launched upon the market with certificates from the profession, and in a brief time our therapeutic literature is full of the wonderful powers of the latest discovery. I do not mean the paid advertisement of the manufactory appears, but article after article from medical men laud the remedy, and the rest of us buy and try.

I am entirely incompetent to remember even the names of these new remedies, much less can I carry to the bedside the distinctive action of each. Some of them I believe are being accepted as of value, but even the best known, as sulfonal, phenacetine, and salol, still hold a precarious position am g remedies of accepted value.

writings of many of our best clinicians bear the im- of truthfulness and learning. When found in lectures ir college classes or in articles read before medical es, they more often carry weight, because rarely do

such authors reason from insufficient data. But the writings of hundreds of essayists, as produced in our medical journals, either carry no weight or are positively instrumental in unsettling in the minds of some, facts which seem already firmly established. The report of the treatment of one case is valueless unless by similar cases the same result is observed many times repeated. Many persons ill, recover in spite of the remedies, not by reason of their administration.

Fashion has much to do with our medical literature. It is interesting and instructive to go back some time and glance over the pages of our medical journals, truthful exponents of the prevailing medical thought. It was not long ago when on almost every page was recorded something about the gaseous injection for the treatment of consumption, a kind of back-door entrance to the lungs. Then came Koch's discovery, the injection of the wonderful tuberculin, which was to give vigor to the nearly dead. Therapeutic literature was crowded with the wonders of the cure. Then came the discussion of Brown-Sequard's testicular juice, high authority but crazy, and lo! literature was filled with experiences. So might the list be lengthened even to the inclusion of Hammond's Animal Extracts, a quack nostrum, you say, but not worse than all the rest, a return in fact to the dark ages, when liver, lung, urine and feces were supposed to contain life-giving principles.

Let common sense control your mind, so that in your reading your impulse will be to accept only that which reason tells is true and wise and sensible. Medicine is not necromancy, nor are therapeutics jugglery; the same laws which govern in nature govern our bodies; if nature in her methods can control our every-day normal living, then can she as well attempt to restore to health perverted action. That literature which teaches that remedies are but nature's assistants will live, but that which spreads theories opposed to nature's laws must pass away to molder and decay.

The value of our recent therapeutic literature depends

entirely upon the matter presented and the character of the writer. Preconceived ideas must not be proven by misstatements or perversion of facts. Theories of themselves are worthless, and can only give zest to speculation. One fact proven is worth any number of theoretical vaporings, and the literature of the present as well as of the future, to be worthy of the honored class it seeks to represent, must be shorn of all that springs from ignorance, egotism, falsehood, fashion and avarice.

DISCUSSION.

DR. BEARDSLEY:

I do not like to see such an excellent paper as that go by without saying something, and I see so many here better qualified to talk on this subject that it is with reluctance I rise to my feet. However, there might be something said in this case, and to preface this subject I will say that I have decided ideas as to the good accomplished by rational therapeusis. Before going into anything of a discussion on this, let me draw your attention to some facts in experimental physiology, so that we may have a clear understanding. You bare the heart of the frog and it will pulsate for an hour or more. You drop on that a solution of common salt, say 1:1000, and it will pulsate once or twice and cease in diastole. After it has been quiet from one to three minutes, you drop upon the same heart a solution of atropine, 1:10,000, and in a moment's time it will pulsate regularly for a time as if nothing had occurred. Now, what is the cause? You make an examination of the nerve, and you will find the axis cylinder composed of very fine fibres. It is covered with a very fine sheath, the nerve sheath, and over that is the substance of Schwann, and over that again is the membrane of Schwann. When you apply the salt preparation, you cause the substance of Schwann to become corrugated. We may assume that that nerve has been simply compressed by the substance of Schwann, and has changed its axis cylinder or made a shorter circuit and the heart has stopped. You take the same nerve and apply the atropine, and you will find the substance of Schwann, that is beneath the membrane of Schwann, spreads out and becomes enlarged. Cut this out, drop it into alcohol, make sections of it and ex-

amine it under the microscope. You will find corrugations, and the nerve is smaller, whereas in the other instances you will find it larger. Now, if medicine has a direct effect on the nerve, and you know this to be a fact, can you not make use of it in therapeutics? We have in medicines great potency, and we hope to advance so much in the therapeutic art that by study of the physiological action of drugs we may acquire the faculty of administering drugs rationally.

MIDDLE FLORIDA AS A WINTER RESORT FOR INVALIDS.

F. D. Case, M. D., Ashtabula.

In this vast expanse of country, taking Ohio as a central point, within a limit of three or four days' journey every shade and gradation of climate is obtainable. "Between fur and gauze" it is only a question of forty-eight hours' travel.

Leaving the frozen shore of Lake Erie under its heavy mantle of "the beautiful" in January, 1893, we saw "the last white frosting on earth's cake" disappear in Southern Kentucky, and when on the second afternoon we left the cars for dinner at the famous Piney Woods Hotel in Thomasville, breathing the balmy air of a northern June, it seemed only a sweet foretaste of summer accidentally mixed into the bitterness of an arctic winter; and when on the following morning in Jacksonville we are wakened by the singing of the birds, and through the open windows the fragrance of the roses steals upon us, we instinctively rub our eyes lest perchance it might prove "only a dream."

Florida is unlike any other land. It is peculiar in its climate, soil, products and surroundings. The peninsular portion is a strip of land three hundred miles long and about one hundred miles wide, running out into the ocean.

Bounded by the swiftly flowing Gulf Stream upon one side and the warm waters of the Gulf of Mexico itself upon the other, its surface covered by a luxuriant forest, Florida presents a combination of climatic conditions that exists nowhere else to the same degree.

Middle Florida, comprising the richest section of the penin-

sula, lies between the 27th and 30th parallels of north latitude. The native forest still covers the land, save where, as along the railways and navigable streams, it has given place to orange-groves and clearings.

To the ordinary traveler Florida seems a level, forest-covered, sandy plain, varied by occasional ranges of bluffs and interspersed with countless lakes. If the traveler is observing, he will notice that above tide-water the streams have a rapid current, indicating a considerable elevation at the source, and if he consults topographical engineers he will learn "that an elevated ridge or plateau extends down the peninsula to about the 27th parallel of latitude. This ridge or watershed is probably one-third nearer the Gulf than the Atlantic," and is from one hundred to nearly five hundred feet in elevation, the latter point being approximated, however, in only a few places. The surface of the watershed and its western slope is undulating and somewhat hilly, and is not a dead level, as many who have seen only the eastern side along the St. John's and Indian rivers suppose.

It is interspersed with numerous beautiful lakes, many of them of great depth, with margin and bottom of white sand. The water is of wonderful clearness, the bottom being often visible at a depth of ten to twenty feet. It is potable even in the Everglades, which is only a shallow grassy lake. Outside the larger towns, water for domestic purposes is usually obtained from driven wells varying in depth from ten to sixty feet. It is pure, clear and soft.

The lands are generally classified as hammock, savanna, swamp and pine. These classes are subdivided into many varieties, such a high and low hammock, rolling pine and flat wood, etc.

"The pine-lands are the most extensive, and some of its forests rival those of the Atlantic slope." "The hammocks are also very extensive, and covered with live-oak and other oaks, hickory, gum, magnolia and luxuriant undergrowth."

The rolling pine-lands have as a rule a very open, porous soil, and because of lack of natural fertility and want of moist-

ure in the dry season of winter and spring, are not well adapted for general farming. They are however easily cleared and readily brought into cultivation, and with some fertilizing and irrigation have been found well suited to orange culture and indeed all fruits.

The cleared land looks not unlike an ordinary sea-beach; but the soil is rich in limes and phosphates, and when the traveler sees "square miles of thriving orange-groves growing out of this barren desert, he realizes that Florida sand is not like that of other lands."

The soil in the hammock-lands is a dark, rich, vegetable mold, and will "make crops" for years without fertilizing, but is not considered as healthy for residence as the pine-lands, especially for the first few years after being cleared. These lands are well adapted to gardening and truck farming, and the growing of early vegetables will always be among the leading industries of the State.

So much in regard to the natural features of the country has seemed necessary in order to remove the erroneous impression largely prevailing outside the State, that the Florida peninsula consists of little else than swamps and malaria-breeding cesspools, that fog, dew and rain are the ordinary climatic conditions, that "atmospheric humidity is proverbially excessive," and that the residents suffer annually if not perennially from malarial toxæmia in some form.

Florida will compare favorably with any of her sister States as to natural healthfulness. According to the census of 1880 the ratio of mortality from all causes per 1000 of population was 11.72, compared with which few even of the newer western States give an equally favorable showing. Thus the rate of California was 13.33, Colorado 13.11, Minnesota 11.57, Ohio 13.32, while for New York it was 17.38 and for Massachusetts 18.59. The proportion of deaths to each 1000 births is for Massachusetts 239.7, New York 225.6, Florida 99.4. The mortality of children under one year of age to 1000 born is for Massachusetts 170.5, New York 157, Florida 66.3.

During the summer months malarial fevers do occur in some localities, but are by no means so common or universal as is commonly supposed, and according to the official report of Surgeon-General Thos. Lawson, of the United States Army, published in 1856, "diseases that result from malaria are of a much milder type in the peninsula than in any other State in the Union." He further says, "As respects health the climate of Florida stands pre-eminent," and "it may be asserted without fear of refutation that Florida possesses a much more agreeable and salubrious climate than any other State or Territory in the United States."

Surgeon Southgate, who served with the troops in Florida during the Indian wars, said: "I think it a weak enthusiasm to conclude that Florida is the healthiest country on the face of the wide world."

The statement has been made by authority, that the Diston companies, who for upward of eleven years conducted extensive dredging operations in the lower part of the State in the region of the Everglades, have never employed a physician nor lost an employee from death, nor have any men left the service of the companies because of inability to stand the climate or work. These employees are nearly all white men, and the fact that no sickness appears among them speaks volumes for the healthfulness of the country.

A large proportion of those who would be benefited by a change of climate must also find a means of livelihood. The opportunities for employment are numerous and diversified, due to the rapid industrial development now going on in the State, while those who enjoy the rod or gun will find here a "sportsman's paradise."

Climate is the sum of the influences exerted upon the atmosphere by temperature, rain-fall, humidity, pressure, sunshine, soil, proximity to the sea, and general topography of the country. Therefore in estimating the climate of any place, "it is necessary that the force of all the factors should be ascertained severally, in order to arrive at a correct conclusion with relation to the general result of the combined

action." Helen Hunt Jackson said: "Climate is to a country what temperament is to a man — fate."

In the following tables, compiled from the Government Signal Service Reports, and the United States Army Medical Reports published in 1856, I have included only the winter months, since it is from November to April, "from the falling of the leaves to the opening of the lilies," that most concerns the invalid.

St. Augustine, Titusville and Jupiter are on the Atlantic coast; Sanford is on Lake Monroe, St. John's River, and about thirty-five miles from the Atlantic; Fort Meade is on Peace Creek, and is about sixty miles from the Gulf coast. Tampa is at the head of Hillsborough Bay, the eastern division of Tampa Bay, and is about twenty-five miles from the Gulf coast. Cedar Keys, Tarpon Springs and Punta Rassa are all on the Gulf coast.

MONTHLY MEAN TEMPERATURE, MAXIMUM AND MINIMUM, AND AVERAGE BAROMETER DURING WINTER MONTHS FOR A SERIES OF YEARS.

STATION.	Position of Station.			November.	December.	January.	February.	March.	April.	Average for 6 months.	Date.		Maximum.	Minimum.	Time, years.	Average barometer.	Authority.
	Lat.	L'ng.	Alt.								From	To					
St. Augustine	29.48	81.05	20	63.9	57.5	56.5	60.5	61.9	68.6	61.5	1824	1852					U. S. M. Post.
											1888	1893	87	26	5	----	Sig. Service.
Titusville	28.34	80.51	----	67	61.7	60.7	63.6	63.2	69 3	64.3	1888	1892	89	32	4	30.11	" "
Jupiter	26.57	80.07	----	72	67.1	66.2	68.1	66.8	74.4	69.1	1888	1892	88	33	4	30.09	" "
Sanford	28.48	81.23	----	62.2	56.7	57.6	57.9	62	68.5	60.8	1886	1887	--	--	1	----	" "
Ft. Meade	27.50	82	80	68.5	61.1	58.4	63.2	69	69.9	65	1851	1854	88	27	4	----	U. S. M. Post.
Cedar Keys	29.07	83.03	35	63.4	57.2	56.5	61.4	62.8	70	61.9	1888	1889	83	29	2	30.12	Sig. Service.
Tarpon Springs	28.09	82.46	----	65.6	61.1	59.1	65.1	64.1	71.2	64.4	1888	1893	92	28	3	----	" "
Tampa	27.57	82.28	20	67.1	62.8	59.1	65.2	65.3	70.7	65.7	1825	1854	--	--	--	----	U. S. M. Post.
											1890	1892	86	31	2	30.11	Sig. Service.
Punta Rassa	27	82.18	5	66.1	64.1	62.3	67.5	68.1	73.3	66.9	1873	1874	--	--	--	----	" "

MONTHLY MEAN PRECIPITATION, NUMBER OF RAINY DAYS, VELOCITY OF WIND DURING WINTER MONTHS FOR A SERIES OF YEARS.

STATION.	Time, years.	November.	December.	January.	February.	March.	April.	For 6 mos.	Number rainy days.	Av. velocity of wind.	Maximum velocity.
St. Augustine	5	1.69	2.14	2.89	2.98	3.15	2.13	11.83	------	------	------
Titusville	4	3.76	3.48	3.22	2.56	2.78	2.17	17.97	51	10.5	52
Jupiter	4	3.53	2.46	4.40	2.83	2.35	1.71	17.28	52.5	10.1	42
Sanford	-----	------	------	------	------	------	------	------	------	------	------
Ft. Meade	1	4.25	6.70	0.15	3 95	2.70	0.35	18.10	------	------	------
Cedar Keys	2	3.50	2.72	4.40	3.56	1.51	0.78	16.47	------	9.5	48
Tarpon Springs	3	1.50	2.13	3.24	1 94	3.27	1.51	13.59	------	------	------
Tampa	2	2 65	1.24	2.60	1.06	2.91	1.54	12.	38	5.6	30
Punta Rassa	1	1.81	1.98	4.02	0 52	1.18	0.54	10.05	------	------	------

The reports from which the foregoing tables were compiled do not in all cases represent the same series of years, so that for purposes of comparison its value is somewhat impaired. Nevertheless it fairly represents the climatic conditions of each locality named.

The winter sky of Florida is almost a changeless blue. The poets and romance-writers have embalmed in song and story the blue skies and endless sunshine of Italy, yet "the sky over the cotton-lands of Georgia is as soft as that of Tuscany; the blue above the silver beaches of Florida melts as languorously as that above Capri's enchanted shore."

While in the light of our present knowledge we cannot formulate any exact statement as to the influence of even the most potent elements of climate, yet all recent writers seem to agree that the first requisite of an ideal climate, the chief factor and the one common to all localities that furnish favorable results, is pure air; air free from smoke and dust, and free from micro-organisms, non-pathogenic as well as pathogenic—in a word, aseptic air.

Dr. Loomis holds the opinion that evergreen forests render the air both aseptic and antiseptic, by reason of the chemical combinations between the volatile emanations from pines and the atmosphere, resulting in the generation of ozone and hydrogen peroxide. A location nearly insular, constantly traversed by warm breezes from the sea and gulf, the freshness tempered by an almost unbroken forest, must, barring local contamination, present an atmosphere of almost ideal purity.

Next to pure air in importance is a dry, porous soil. The coincidence of phthisis with soil moisture has been established by Bowditch, Simon and others. "It is shown," says the latter, "to be a disease which develops itself in proportion as men are dwellers upon a humid soil," and Laennec, quoted by Loomis, "makes mention of a locality having such a soil, in which the dampness was so constant and of such a character that more than two-thirds of the resident population died of phthisis." There can be, I think,

no question that the entire list of respiratory troubles, together with gout, rheumatism and Bright's disease, are likewise aggravated by the same condition.

"All the world is cheered by the sun," wrote Shakespeare, and certainly cheer is the word that best expresses the effect of the almost constant sunshine of this "land of flowers." Abundant sunshine, permitting active exercise and an out-of-door life, by promoting respiration and sanguification enables the system to combat successfully the hereditary tendency or individual proclivity to disease.

Whether a cold or a warm climate is indicated in a given case, is often a matter of individual idiosyncrasy, but in either case it should not be subject to sudden and frequent changes. "Cloudiness and rain are not absolutely unfavorable" (Assman). Rain at frequent intervals may have a sanitary influence in washing dust out of the atmosphere, and preventing its being carried about in currents of wind.

Air pressure as a climatic factor has as yet been little studied, yet the investigation so far made would indicate that a high barometer and equable air pressure, like equability of temperature, is of great importance to the sufferer from rheumatism, neuralgia or pulmonary disease.

At best climate is only a condition of cure. It is not a specific. If a change of climate be regarded as enabling the invalid to dispense with the usual lines of treatment, it may become a curse rather than a blessing.

It is perhaps not possible at the present time to distinctly define the specific climates suitable to specific cases; each case should be studied in all its phases before deciding upon a change of residence.

The following points pertaining to the individual, according to Otis and others, require consideration:

1st. Nature of the disease.
2d. Age of patient.
3d. Temperament and mental disposition.
4th. Previous habits and mode of life.

5th. The amount of physical activity the patient has been accustomed to.

6th. The matter of domestic ties.

7th. Is the patient to be placed in an environment of invalidism, where he will have his malady suggested to him continually, by seeing others sick and dying with it about him?

Patients should not be sent to health-resorts to do as they think best. They require the watchful care of a physician familiar with the climatic and sanitary conditions of the locality selected, and only when food, habits, occupation and mode of life are wisely regulated, will the result of a change of climate be beneficent.

Tranquility and peace of mind are most important. Patients suffering from nostalgia seldom improve. To select pure air, the right temperature and abundant sunshine is doubtless wise, "but unless the patient can carry contentment with him, sunshine in his soul, it would be better for him to stay at home."

But I must hasten on to the question as to what patients will be benefited by a winter residence in Florida. Experience has demonstrated that the climate is adapted to cases of phthisis in which the deposit is incipient or limited, where there is not much constitutional disturbance, and where the invalid still retains a fair amount of bodily vigor.

With fully tuberculized lungs and discharging cavities, with daily fever and general debility, little aid can be given; though the pure air, bright sunshine and mild and equable temperature may aid in pleasantly prolonging life. "Much of the suffering of the consumptive is due to bronchial irritation, pneumonic pains and catarrhal annoyances" (Levis), and these conditions are relieved by the favorable climatic influences.

Bronchitis, asthma, laryngitis, imperfectly recovered pneumonias, winter cough and catarrhal affections of the naso-pharynx, all cases that grow better in the warm settled

weather of our northern summer, and grow worse in early winter, do remarkably well with a winter sojourn here.

Rheumatism, neuralgia, gout, incipient Bright's disease and cystitis, are all benefited by a climate that offers a maximum of air pressure, a genial temperature, and a minimum of change.

Sufferers from neurasthenia, the overworked, head-worn and jaded of both sexes, find the winter atmosphere most soothing and rest-giving. Nowhere in this broad land of ours can such a man or woman so quickly get relief as here. The aged and infirm, "who after battling with the storms of life and the rigorous winters of the North, now need warmth and rest and relaxation, enjoy the genial sunshine and rejuvenating atmosphere."

But Florida is not a "paradise." Northers do visit it; frosts are not unknown, and the abundant insect life in some sections serves as a reminder that nothing is perfect in this world.

The magical fountain which Ponce de Leon sought, whose waters flowing over beds of gold and gems would ensure to the old a second youth and vigor, has not been found.

And yet this land of "fruit and flowers" with all its drawbacks may at least serve in some degree to

> "Kindle a fever in the blood of age,
> And make the infant sinews strong as steel."

TONSILLITIS.

H. J. Noyes, M. D., McConnellsville.

I desire to call your attention to a few remarks on tonsillitis. This disease assumes two forms, viz.: The catarrhal form, the inflammation extending to the secreting tissues and lining membrane of the crypts, the other to the parenchymatous structure of the gland. These two forms differ considerably in cause, in symptoms, in treatment, and results. In catarrhal tonsillitis there is a mucous inflammation of three or four days' duration. It is caused by exposure to draft, damp and cold. There is prostration and often profuse perspiration. The pulse is weak and quick. Both tonsils are generally affected, but seldom if ever causes abscess. There are lacunæ filled with masses of morbid secretion resembling ulcers. The treatment of catarrhal tonsillitis is by tonics, stimulants and astringent gargles.

Poultices may be applied. They should be kept warm and moist. Lunar caustic may be applied to the ulcers. If the tonsils continue to enlarge, they may be scarified and tincture of iodine applied locally. If the tonsils do not diminish, about half the gland may be excised. Dr. L. E. Holt describes an affection which he thinks is often confounded with diphtheria under the name of "croupous tonsillitis," *New York Med. Journal*, May 8th, 1886, page 517. Chronic catarrhal inflammation of the tonsil with croupous tonsillitis or enlargement is abrupt in invasion. Most marked general disturbance during the first two days; no tendency to asthenia. Starts with a temperature of from 103° to 104-5.° Pulse full and rapid; membrane of a yellowish

color; edges sharply defined; limited to the tonsils; does not bleed when detached; superficial, not very adherent; no tendency to form again after removal; appears early; does not spread. Albuminuria rarely if ever present. Reaches its height by the second day; by the fourth, the patient is generally convalescing. Paralysis never follows as a sequela. It is rarely if ever contagious. Diphtheria is much more often insidious; generally not much general disturbance before the third day, but after that a marked tendency to asthenia. Temperature rarely high, in the beginning 100 to 101,° gradually rising until the fourth or fifth day; when the pulse is rapid it is feeble.

Parenchymatous tonsillitis is a fibrous inflammation of two to four weeks' duration, often caused by inflammation in other parts of the system. There is high fever. The pulse is strong and hard. An abscess is generally formed. Both tonsils are rarely affected. They are often covered with lymph, but there is no collection of secretion in lacunæ. There is extensive œdema. The treatment is by antiphlogistics and depressants, but gargles should not be used except in the form of warm water. Free incisions are very beneficial. This disease is attended by a very serious amount of suffering, and yet it is a local affection and within easy reach. The abscess should be opened when suffocation is imminent. A long incision in the most prominent part of the swelling may modify the course of the disease considerably. The swollen gland has a tendency to push the internal carotid artery outwards, and a vertical incision in the tonsil with a bistoury, or the removal of superfluous portions of it with a tonsillotome, will rapidly reduce the inflammation and most effectually control the disease.

VALVULAR DISEASE AND CHRONIC RHEUMATISM.

WILLIAM W. PENNELL, M. D., FREDERICKTOWN.

But few years after entering the practice of medicine it seemed to me that chronic rheumatism as a cause of heart-diseases was a greater factor than had been assigned to it by most authorities.

Acting upon this idea, more than ten years ago a rather systematic observation of such patients was instituted, with the result of confirming the idea that cardiac disease was gradually developed as a complication in a large per cent. of cases. Regarding chronic rheumatism as a diathetic malady it is not strange that visceral entanglements should occur, especially in structures having a similar texture as joints. Indeed, it is eminently proper to look upon rheumatism in any form as the expression of a diathesis or predisposition of the organism to a particular kind of inflammatory activity rather than another under the influence of cold, exposure and dampness, as well as improper diet.

In the last ten years I have had every opportunity to observe the course of chronic rheumatism in a number of persons. In all twenty-five* were under study, every one of the number being afflicted with chronic rheumatism from the beginning, there being no history of an acute rheumatic fever. Observations were made weekly or monthly in each case; eighteen patients gradually acquired heart-disease, seven thus far escaping.

*These patients ranged from 30 to 70 years.

True, most of these persons were beyond the middle of life and some were in the last quarter, periods when chronic rheumatism is most likely to develop; also the period when senile changes were to be expected as the result of a long series of years of hard labor and exposure in addition to the gradual wane of vitality, with the consequent nutritive alterations in the circulatory system.

There is, so far as I am aware, no anatomical reason why the rheumatic habit should not produce ravages in fibrous tissue though it be located outside the articulations. Just why some should teach us that the fibrous rings of the heart and the fibrous material of its valves and arteries have exemption in the chronic form, is difficult to understand. But few medical authorities mention the possibility of complications of the sort; and then the cardiac disease is generally said to have had its initial in the acute rheumatic attack that precedes the chronic in many individuals. Fewer still are the writers who ascribe heart-diseases directly to chronic rheumatism pure and simple; but all are willing to believe that the age of the patient, when valvular disease manifests itself, has more to do with its production than diathesis.

In my experience persons with chronic rheumatism for the most part do sooner or later manifest some form of heart-disease, and the lesser number escape anything of the kind. Of the number manifesting such complications, being late in life, the cause is ascribed to senility and not to rheumatism. On the other hand, the majority of old persons never having had rheumatism of any kind do not exhibit alterations of the heart more frequently than they do of any other organ or structure. And yet it seems scarcely possible for a person of 70 years with chronic rheumatism to escape some lesion of the endocardium. Out of a great many patients affected with the acute disease it has been my fortune to see but few have peri- or endocardial complications from a single or a subsequent attack; but individuals subject to repeated or recurring seizures do for the most part become victims to heart-disease, more especially when between acute invasions

they suffer more or less with subacute or chronic articular inflammation.

But this demonstrates the essentially diathetic source of the disease, the same as when we meet a case of acute peri- or endocarditis that is soon followed by acute articular rheumatism; or as I have a few times seen an individual with a chronic valvular lesion, evidently rheumatic in character, acquire chronic rheumatism of the joints. This habit, if not hereditary, is quite readily obtained by some persons, since they require less exposure, dietary errors and dampness to produce it, when more exposure, more dietetic intemperance and less sanitary care would produce anything but rheumatism in other persons. On the theory that rheumatism is the result of diathesis, it is reasonable that the same *materies morbi* which, by its presence or influence, alters the nutrition of the fibrous structure of joints, would by constant circulation in the blood gradually manifest itself in other fibrous tissues, especially the heart, since it is unremittingly exposed to this influence. The difference between acute and chronic rheumatic inflammation is nothing except degree and duration of disease. They seem to be the same, modified by the patient's inherent powers of resistance. Be that product of the individual peculiarity uric or lactic acid, or both, or whatever it may be, it has a predilection for fibrous and fibro-serous tissues. If one form is specific, the other is specific; the unity of cause consisting of the production within the body of morbid matter, either from interference with excretion from continued exposure to cold and wet or the elaboration of toxines from improper food. But these are far from establishing the specific nature of rheumatism. It more clearly demonstrates its constitutional character. The general type of the acute form is shown by the pectoral and abdominal complications that often occur, as well as keratitis and iritis, and its affinity for the nervous system in the occasional production of chorea. So in the chronic form the occurrence of pectoral and abdominal troubles due to a rheumatic cause are pretty well known.

In addition to these, it is supposed that it has been the experience of other physicians in common with my own to have seen headaches in chronic rheumatic patients that were not due to heart, liver, gastric or kidney disease, but subject to the variations of barometric pressure and relievable only by anti-rheumatic treatment, dietary, sanitary and medicinal. Our experiences have, no doubt, coincided in that we have once in a while seen a case of chronic rheumatism persist for four or five years and then vanish as mysteriously as it came, leaving the patient little the worse for the visitation, except a stiff joint or so.

Our common experience is to see the gradual deterioration wrought by primary continuous chronic rheumatic disease. Joints becoming weaker and stiffer, structural changes in ligaments and capsules becoming more pronounced, accompanied with pain of variable severity, and yet the general health of the patient remains quite good, but unable to work and hardly able to walk without crutch or cane. It is said to scarcely ever kill. This may be true, but it has seemed to me to do the reverse by inducing endocardial and arterial changes that result in stenosis, insufficiency or endarteritis that indirectly do kill, or else I have had more than my share of coincidences or am wofully shortsighted.

Complete recovery hardly ever occurs, except in recent and mild cases which are removed from the conditions that feed the rheumatic habit and thus receive permanent improvement if not cure. Those that have had the disease but a comparatively short time should not be discouraged with the idea of its incurability, but rather to have pointed out to them a possible means of escape, if not from the entire disease itself, then the ultimate consequences of the malady by permanent arrest. For those that have become confirmed and intractable and have as yet shown no cardiac disturbance, as much immunity as possible should be secured against such complications. And where heart-diseases have already developed, then their consequences

should be avoided so far as they can. In these latter cases we get the good effect of internal medication, namely, that directed at the cardiac complication, and that is the persistent use of digitalis. Medicines do little good for chronic rheumatism. Its best treatment is in massage, electricity, baths and diet. Elimination is the watchword in this disease. Massage through its effect on the circulation favors excretion, as do baths by stimulating the skin. The utility of diuretics and laxatives cannot be overlooked. The diet should be vegetarian as can be to preclude the introduction of toxic ptomaines or their production within the alimentary canal.

But this paper is not devoted to treatment of chronic rheumatism, but rather to point out in a feeble way one of its most fearful consequences.

The lesions of the heart do not differ in their symptoms from those from other causes, and like those arising in the acute disease, have a more favorable prognosis than those resulting from degenerative changes which are necessarily progressive; perhaps more amenable to arresting treatment than the acute, since their growth or development is slow; and once developed to any degree, they are permanent, their situation determining their gravity. But if in the management of this disease these lesions could be avoided, our work has not been in vain.

CASE OF SYMMETRICAL GANGRENE FROM POLYURIA, WITH NATURAL AMPUTATIONS.

JARED E. CONE, M. D., YOUNGSTOWN.

December 1st, 1887, I was called to see Hattie S., aged nine years. She had been suffering for about a year with gangrene of the fingers and toes, and they had all sloughed off, and at time I first saw her her hands and feet were dead and a line of demarcation was forming about two and one-half inches above the ankle- and wrist-joints. I found her very much emaciated, only weighing forty pounds. She complained of pains in the back, and had severe pains in the calves of her legs, and was micturating about every fifteen minutes. She was drinking a large amount of water, and she passed about two gallons of urine in twenty-four hours. The specific gravity was one thousand, no sugar, no albumen, and alkaline reaction.

I gave her morphine to relieve the severe pains and cramps. In fact that was all I was called in for, to ease her for the few hours her friends thought she had to live, and while waiting for the morphine to take effect, I noticed this free action of the kidneys, and the thought struck me that it might be gangrene from diabetes, and I requested the mother to measure the urine she passed in twenty-four hours and I also took a sample to my office for analysis with the result as stated above.

Not finding any sugar, I concluded that the cause of the gangrene was a relaxed condition of the capillaries and smaller blood-vessels all over the body, and that this relaxed condition was due to some disturbance of the vaso-

HATTIE STANDLEY.

motor nerves, the relaxed vessels in the extremities, hands, feet, tips of the nose and ears causing a stagnation of the blood with consequent death of tissues. While in the kidneys the relaxed vessels allowed more water to be thrown off than if the vessels had their normal contractility. Acting on this theory, I gave her ten drops of fl. ex. ergot every three hours, which by the end of the week reduced the amount of water to one gallon in twenty-four hours and raised the specific gravity to one thousand and four. The pains and cramps were less severe, requiring but one or two small doses of morphine a day to relieve them. By the end

of the second week the amount was almost normal and the specific gravity was one thousand and eight, with very little pain and no cramps, and the ergot was discontinued or only given when there was a tendency to an increase of the amount of urine. I think the result obtained from the treatment confirms my theory of the case.

But we will return to the hands and feet, and see how nature can remove or in fact make amputation of bones as well as soft tissues, and make stumps that the instrument-maker who made her artificial limbs said were the best he ever had to fit with limbs.

The lines of demarcation as stated were about two and one-half inches above the joints, and on the shin or inner surfaces of the tibias they extended by a narrow strip almost up to the knees; but this strip only involved the skin, and made a large surface to be again covered with integument, on which I afterwards did some skin-grafting, using very small pieces of chicken-skin from a chicken just after it was killed, and these minute particles of skin formed centres which came together, covering this surface over with healthy integument. The hands and feet came off at the joints, the soft tissues extending above as stated, the bones being left sticking out or protruding from under the flesh.

I wanted to remove them, but the mother would not let me, and the child was in such a critical condition at this time that the shock that would have followed their removal would have killed her, so all that I could do was to keep them clean, which I did by washing them with antiseptic washes (carbolic acid, bromine, etc.), every other day for over a year. After four months one of the protruding ulnas became detached about an inch under the flesh, and soon came away, and then the other ulna, the two fibulas and the radii and tibias followed in the order named, all having their line of separation under the flesh, or in the proper place to make good stumps, the last bone coming off almost a year after I first saw her. After this healing of the stumps took place she gained in strength and weight very rapidly. At the

end of the second year she was fitted with artificial limbs and was sent to school. She has been quick to learn, and has been advanced until she is in the grades with scholars of her own age. She can write a very fair hand; she has a copper band that fits her stump, with a small tube soldered on the side to hold a pen or pencil. She also crochets lamp-mats, and does other work with her stumps that seems almost impossible. She has good use of her artificial feet and legs, and can walk without the use of a cane. In fact she could not use one if she wanted to.

I have never been able to find reported a case similar to this one, and hence take an interest in reporting it to you.

CREMATION AS A MEANS OF PRACTICAL SANITARY REFORM.

CHAS. P. KING, A. B., M. D., NEWARK.

It is a trite saying that a man is never really appreciated until after he is dead. One of the idiosyncrasies of our common nature is, that we seem to have more consideration for a man after he is dead than when he is living. Very often we disparage and neglect him while in the flesh, and esteem and eulogize him in the grave.

Our respect may be slender or small for the breathing, thinking, sympathetic form, but a certain sacredness attaches itself thereto the very moment it becomes clay. The divine spark, the godlike element as it is styled, appears to count for naught save by its absence.

Exanimation has more power than great deeds to make heroes, for the shadow of the tomb is a glamour to the living. Hence we find that among all nations there seems to be thrown a halo of sacredness around the bodies of their dead. This feeling seems to have been implanted in the human breast by an all-wise Creator. Massive tombs, as well as costly sarcophagi, mark the last resting-place of the illustrious dead of all ages, and millions of dollars are spent annually in embellishing our beautiful cemeteries, where the ashes of our loved ones repose.

How shall we dispose of our dead? is a question which has agitated the mind of man from the creation down to the present time. Sanitary science has during the past few years thrown a flood of light upon this important subject, which we are warranted in saying was almost entirely un-

known among the ancients, or even as far down as the beginning or close of the last half-century. And while they excelled us in many of the arts and sciences, such as the art of embalming, sculpture and painting, they were far behind us in that most important of all sciences, *sanitary science.* It is a statistical fact that many of those terrible epidemics, such as the plague, Asiatic cholera, yellow fever, and many others which have from time to time almost depopulated some portions of the globe, can be traced to errors in the common laws of sanitation and which with proper care might have been averted, thus saving millions of precious human lives. Great benefit has arisen from a careful attention to the laws of sanitation, which have been assiduously studied of late years by many zealous investigators of this branch of medical science.

Cremation as a means of preventing the spread of disease, is again coming to the front, and the subject is being discussed at length not only by leading scientists in our own country, but also throughout continental Europe. Cremation, or the burning of human corpses, appears to have been a general practice in early times among various nations with but a very few exceptions. The three exceptions to the rule we find to have been, first, among the Egyptians, where the bodies were embalmed; in India, where they were laid away in sepulchres; and in China, where they were buried in the ground.

The practice of cremation was of great antiquity, and of no slender extent. We read of the Grecian generals, of Homer, of the funeral obsequies of Patroclus and Achilles, also of the funeral-pyre of Hector, burnt before the gates of Troy. This same practice extended to the West, and was in use with most of the Celts, Sarmatians, Germans, Gauls, Danes, Swedes, Norwegians, and lastly among the Carthaginians.

Cornelius Sylla was not the first whose body was burned at Rome, but he was first of the Cornelian family. From this time the custom spread rapidly, and soon became the

prevailing practice. The Egyptians were afraid of fire, not as a deity, but as a devouring element, mercilessly consuming their bodies and leaving too little of them; and therefore by precious embalmments, depositure in dry earth, or handsome enclosure in glasses, they contrived the notablest ways of integral consecration. At Rome, burning was the rule down to the close of the fourth century. Whether in any of these cases cremation was adopted on sanitary grounds is somewhat doubtful, and we are inclined to the belief that it was adopted more on religious grounds, having been handed down by tradition from the fathers.

Cremation is still in vogue in a great portion of Asia and South America, but in different forms. Among some the ashes are stored in urns, among others buried in the earth or thrown to the winds. The urns used by the ancients, wherein were deposited the ashes of their dead, were very elaborate, and were guarded with great care lest some ruthless hand might destroy or deface them. Some of these urns are found to-day in a perfect state of preservation in the famous Appian Way near Rome.

The custom of urn-burials, although a relic of antiquity, after all had a beautiful sentiment connected with it, and always had a charm for us. It precludes forever the baneful thought of our bodies moldering in the grave, and then being devoured by worms. We are often, too, confronted with the horrible thought that after our remains are laid to rest in the grave, our bodies may be disturbed and our graves desecrated by strange hands. And as Sir Thomas Browne has so aptly expressed it in his "Urn Burial," "To be gnawed out of our graves, to have our skulls made into drinking-cups and our bones turned into pipes, to delight and sport our enemies, are tragical abominations all escaped in burning burials."

It is related of one of America's greatest surgeons, who died only a short time ago, that he became a thorough convert to cremation long before he died, and requested that his body should be burned. Having been asked his reason,

his reply was: "That he did not wish to have his grave desecrated by some antiquarian looking after specimens in the earth, and to come across his body and bones and ask what antediluvian race he belonged to." Such a thought was abhorrent to a man of his fine feelings and sensibilities; and yet how often such things do occur, and we know it, even in this boasted nineteenth century. Need we call to mind in this connection the indignities which were heaped upon the body of the immortal Cromwell, after the restoration of Charles II. of England, how his body was ruthlessly torn from its last resting-place by the infuriated mob, and thrown into the Tyburn, amid the sneers and jeers of the rabble? History repeats itself, and is full of just such horrible barbarities.

We are aware that the idea of cremation is abhorrent to many minds, and justly so, we take it. Still, after all, it is a matter of education to a very large extent. We must remember that the mode of cremation now in vogue is very different from that practiced by the ancients. The old funeral-pyre is entirely done away with. The fire does not touch the body at all. It is placed in a clean retort, and is so admirably arranged that the whole body is consumed in a very short space of time without a particle of the fire coming in contact with the body. The ashes are then deposited by the friends of the deceased in a beautiful urn for safe-keeping. This, to me at least, does away with the horrors which surround the old custom of cremation. Says one of our able authors: "Christians have handsomely glossed the deformity of death by careful consideration of the body and civil rights which take off brutal termination, and though they conceded all reparable by a resurrection, cast not off care of interment."

It is from a sanitary point of view mainly that we desire to discuss this all-important subject. If it be true that diseases are propagated by bodies buried in the ground, is it not the duty of the sanitarian, and philanthropist as well, to

devise if possible some means by which the living may be protected from the dead?

Science speaks out loudly on this subject, and what is her solution of the problem? It is only within the last quarter of a century that the relation of microbes to infectious diseases has led to efforts for the substitution of burning for burial. It is only within the past few years that no less a personage than Sir Henry Thompson, the great English physician, in some very learned papers contributed by him to the *Contemporary Magazine*, said that burial involved much danger to the living, and urged the advantages of cremation. This is but the reiteration of the germ-theory of disease, so ably advocated by the leading savants of Germany. The attention recently given to the subject by such leading thinkers has resulted in the formation of cremation societies and the erection of crematories in various parts of Europe and America. Both sentimental and legal obstructions had to be overcome, and not until 1884 was the first body cremated in England. In our own country one of the first crematories was built at Washington, Pa., under the direction of the late Dr. Lemoyne, of that city, who was a very distinguished physician and convert to the theory. Since that time they have been built in very many of our large cities.

It is asserted (and the truth of the assertion is no longer questioned) that the efforts to arrest infectious as well as contagious diseases, such as scarlet fever, diphtheria, and some others, are frustrated by the burial of infected bodies; for though the microbes themselves may die, their spores or seeds have very great vitality; that the burial of bodies of those who have died from these diseases does not destroy the contagion that still lurks within them; that in the neighborhood of cemeteries there is a constant increased risk of contamination of both air and water. The problem is solved by the practice of cremation.

Pasteur's researches have proved that earthworms bring up to the suface microbes from the bodies of infected animals

buried several feet deep. Prof. Darwin shows that in one case in fifteen years worms had accumulated worm-mold to the depth of over three inches, and in another case during eighty years had accumulated an average depth of more than a foot. In the field in the Jura where a diseased cow had been buried at the depth of nearly seven feet, Pasteur showed that the mold which had collected two years later contained germs, which on being inoculated into a guinea-pig produced death from the same disease from which the cow died. In a Yorkshire village part of a disused graveyard was taken into the rectory garden adjoining; on the earth being dug over, scarlet fever broke out in the rectory nursery and thence spread over the entire village. It proved to be of the same type as that from which thirty years before the natives died who were buried in that particular spot in the graveyard. On opening a small-pox burying-ground in Quebec, one hundred and fifty years old, the small-pox immediately broke out among the workmen. We give the above as facts, and the reader is allowed to draw his own inference. One fact is worth a thousand theories.

During the past year that most terrible of all modern scourges, Asiatic cholera, has been devastating the continent of Europe, and some cases were reported in New York. Strict quarantine regulations were at once established, and by this means this terrible scourge was prevented from becoming epidemic in our country. We see that in some of the cities in Germany where the disease has been prevailing with such frightful mortality, cremation has been practiced as the best and surest means of disposing of the bodies of the dead and of preventing its propagation. We do not believe that the disease will ever get a firm foothold in our country, from the fact that the sanitary condition of our country is much better than that of our neighbors across the water. It is to be hoped that if the disease should assume an epidemic form the coming year, that every means will be employed to avert it. Should it be observed by those who are in charge of affairs, that the spread of the disease cannot

be averted by ordinary means, and should cremation be deemed necessary, we think no obstacle should be thrown in the way of our Government of its being carried out to the very letter. We are happy to know that steps have been taken by our Government in placing restrictions upon immigration, they not allowing vessels from infected ports to enter our harbor during an epidemic without examination.

Professors Koch and Pasteur both claim that they have practically demonstrated the fact that the cause of Asiatic cholera and other infectious diseases is owing to a very minute bacillus, which is of a living nature and can only be discovered by the aid of the most powerful microscope; also that these bacilli are very numerous, infecting the stomach and alimentary canal; and that they are carried into the human system through impure drinking water, breathing impure air when the disease is prevailing, and from clothing, and even can be carried by the means of the hands, when not properly cleaned and disinfected; that they have wonderful tenacity of life, and are reproduced very rapidly; they meet extremes of both heat and cold—boiling could not destroy their vitality entirely, nor could extreme cold render them innocuous. The treatment by *inoculation* is the one now advanced by Professors Koch and Pasteur, and they claim by this means the bacilli can be destroyed in the system, and the violence of the disease very much modified if not removed entirely.

Whether this theory is the true one or not still remains to be proven. We do not think a sufficient time has elapsed since the new doctrine was promulgated, to predicate a positive opinion. Time, however, will demonstrate the truth or falsity of the theory. We are somewhat of a "doubting Thomas," yet we hope for the best; and if the theory should prove to be the correct one, it will be one of the greatest discoveries of the century, and the names of Koch and Pasteur will go down to posterity along with those of the immortal Harvey and Jenner, and others whose lives have marked an epoch in medical science.

Professor Bouchard, member of the Paris Academy of Medicine and Professor of Pathology and Therapeutics, in his late scholarly work "On Auto-Intoxication in Disease, or Self-Poisoning of the Individual," is not a disciple of the Koch theory, but an expositor of the doctrine of toxic secondary products, either by the microbes or by the combination of substances within the body, as the direct cause of infectious diseases—a doctrine now held by very many learned men in the profession.

The theory, too, as to the hereditary character of pulmonary consumption is now being successfully combated by many in the profession. They claim that it is highly contagious in its character, and advocate the isolation of the patients in the advanced stages; and that the disease can be acquired by a healthy person when constantly exposed to it. The theory of isolation is the great modern weapon in combating all forms of contagious disease. Dr. Cyrus Edson, of New York, a well-known sanitary specialist of that city, is an advocate of this theory.

The age in which we live is very largely a theoretical as well as speculative one, and it is always best not to be too hasty in drawing our conclusions. If, therefore, as has been demonstrated, our efforts thus far have proved unavailing in our attempts to arrest the march of cholera and other infectious diseases, why not resort to the practice of cremation? In this way we destroy entirely the germs of these diseases. Fire is acknowledged to be the great purifier and refiner, and in cases where the disease cannot be arrested by the ordinary means used, why not employ it?

During the past decade very many distinguished chemists and physicians of Italy have advocated the adoption of cremation as a sanitary measure. In Great Britain, also, through the instrumentality of many distinguished physicians it is now being strenuously advocated as the safest and best means of arresting the spread of all forms of contagious as well as infectious diseases. Says Sir Henry Thompson: "Give me the dead body to resolve into car-

bonic acid, water and ammonia as rapidly as possible, and I have no fear of the disease spreading or gaining a foothold in neighborhoods where it is prevailing."

In early times, when our country was sparsely settled, and when there was plenty of room for the burial of our dead, the subject of burial was of but little moment. But now our cities and towns are rapidly filling up with a large foreign element from every quarter of the globe, the death-rate is rapidly increasing, and our cemeteries are crowded. Thus we can very readily see that the time is not far distant when some action must be taken by our municipal authorities throughout our land as to what means should be employed to dispose of our dead in order to preserve the living from infection.

We desire to say a few words also with reference to the custom of burying our dead as now practiced. The holding of public funerals when persons have died with infectious diseases, is reprehensible in the highest degree, and should not be tolerated for a single moment. It is not only the duty of local boards of health, but city authorities as well, to see to it that all such burials should be *private*. We are satisfied that diseases are very rapidly communicated in this way, and that public funerals are the fruitful scource of propagating various forms of diseases. Disinfectants are of little avail in these cases, and are a cloak merely for masking disease; and while they are beneficial in very many respects, they do not nor cannot neutralize the deadly poison. In some of our cities the people have become thoroughly aroused to the importance of this step, and are acting accordingly. The remains of the deceased should not be opened for inspection for a single moment, and they should be interred at the earliest possible moment. The great question which is confronting the physician of to-day is not so much how he should cure disease, as it is how can he prevent it.

There are some other interesting points which we would like to discuss more fully, but will be obliged to omit for want of space. We have endeavored to present this sub-

ject of cremation in a very practical and common-sense manner, and if we have succeeded in saying anything that will be of interest to the profession at large, we will be more than compensated for our time and trouble in preparing this paper. It is no longer an open question with us, whether after all, amid the blazing light of the present century, it would not be more in keeping with the facts as advanced by leading scientists of the day throughout the world, that the practice of cremation should be employed in all forms of contagious as well as infectious diseases, as being the only safe and practical way of furnishing complete immunity to the living.

MEMBERS OF THE

OHIO STATE MEDICAL SOCIETY.

CAPITALIZED: Life members.

Italicized: Deceased since last meeting.

Local Secretaries will please notify the Secretary of errors or omissions, and forward obituary notices with their annual catalogues.

Abbott, C. N., Academy of Medicine----------Cincinnati, 1892
Ackley, Geo. B., Meigs County Medical Society------Pomeroy, 1892
Adams, P. N., Montgomery County Medical Society----Dayton, 1885
Adair, Samuel G., Washington Co. Medical Society----Beverly, 1893
Albl, Michael A., Cuyahoga Co. Medical Society----Cleveland, 1892
Alcorn, A. W. ----------Ravenna.
Alcorn, John B., Gallia County Medical Society----Gallipolis, 1894
Aldrich, Daniel B , Ashtabula Co. Medical Society----Harbor, 1892
Allard, Lorenzo D., Pike County Medical Society ---------Flat, 1894
Allen, Dudley P., Cuyahoga Co. Medical Society----Cleveland, 1885
Allen, Geo. M., Academy of Medicine----------Cincinnati, 1892
Allen, Harlan P., Academy of Medicine----------Columbus, 1884
Allen, S. E., Academy of Medicine----------Cincinnati, 1892
Andre, Orrin C., Hempstead Mem. A. of M.---------Waverly, 1888
Archer, J. R.----------N. Baltimore, 1892
Armentrout, Lyman W.----------Mt. Vernon, 1892
Arms, C. C., Cuyahoga Co. Medical Society---------Cleveland, 1892
Armstrong, C. L., Academy of Medicine----------Cincinnati, 1892
Axline, Chas. Z., Hild. Dist. Medical Society-------Fultonham, 1884
Ayres, S. C., Academy of Medicine----------Cincinnati, 1877
Bain, Frank D., Northwestern Ohio Medical Ass'n-----Kenton, 1885

Baker, A. R., Cuyahoga County Medical Society----Cleveland, 1886
Baker, J. P., Hancock County Medical Society--------Findlay, 1891
Baker, William O., N. E. O. M. A.----------Louisville, O , 1882
Baldwin, J. F., Academy of Medicine ----------Columbus, 1875
Ballinger, J. B.----------Webster, 1880
Bange, Theo , Academy of Medicine----------Cincinnati, 1892
Barnes, Noble P.---------- Comly, 1894
Barnes, J. W., Ross County Medical Society--------Columbus, 1892
Barnes, T. S., Ross County Medical Society--------Chillicothe, 1890
Barnes, W. T., N. E. O. M. A.----------Fredericksburg, 1891
Barnes, R. H., Mahoning Co. Medical Society --------Youngstown.
Barnhill, James U., Academy of Medicine----------Columbus, 1884
Barrere, D. M., Montgomery Co. Medical Society------Dayton, 1884
Barton, T. J., Muskingum Co. Medical Society------Zanesville, 1881
Bates, F. L., Allen County Medical Society----------Lima, 1890
BATTLES, W. S., N. C. O. M. A.----------Shreve, 1858
Bauer, M. M., N. E. O. M. A.----------Lake, 1884
Beach, T. D., Clarke County Medical Society --------Catawba, 1884
BEACH, J. N., Central Ohio M. S., Madison Co.----Jefferson, 1854
Beard, H. C.---------- -----Portsmouth, 1892
Beardsley, C. E., N. W. O. M. A.----------Ottawa, 1869
Becker, Bernard, Toledo Medical Association----------Toledo, 1892
Beck, Jno. S., Montgomery County Medical Society----Dayton, 1879
Beckwith, Seth W., Toledo Medical Association--------Toledo, 1892
Beers, A. M., Tuscarawas Co. Medical Society, Newcomerstown, 1882
Bell, A. E., Muskingum County Medical Society----Zanesville, 1892
Belt, R. C., Miami Valley Medical Society ----------Milford, 1892
Benner, C. T., N. W. O. M. A. ---------- Tiffin, 1891
Bennett, W. C. (Morrow County)----------Iberia, 1892
Bennett, C. A., Clermont Co. Medical Society---Withamsville, 1892
Bessey J. Mortimer, Toledo Medical Association-------Toledo, 1887
Bevington, H. S., Crawford Co. Med. Society--Sulphur Springs, 1892
Bivans, W. A., Brown County Medical Society-----New Hope, 1892
Bird, Edw. H., N. W. O. M. A.----------Dupont, 1892
Black, James R.----------Newark, 1892
Blaine, Harry G., N. W. O. M. A----------Toledo, 1892

Blair, B. H., Warren County Medical Society.....Lebanon, 1892
Blair, James F. (Hamilton County).....Linwood, 1884
Blake, F. W., Academy of Medicine.....Columbus, 1892
Blake, William H., Central Ohio Medical Society...Shadeville, 1878
Bland, J., Crawford County Medical Society.....Bucyrus, 1892
Bleile, A. M., Academy of Medicine.....Columbus, 1882
Bodman, Lewis H., Toledo Medical Association.....Toledo, 1892
Boerstler, George W.....Lancaster, 1870
Bond, John W., Toledo Medical Association.....Toledo, 1892
Boggess, E. M., Fayette Co. Med. Society...Washington C. H., 1892
Bohl, John, Sr., Washington Co. Med. Society.....Watertown, 1892
Bonfield, C. L., Academy of Medicine.....Cincinnati, 1892
Bonner, C. A., Montgomery Co. Medical Society.....Dayton, 1892
Bonner, Horace, Montgomery Co. Medical Society.....Dayton, 1890
Boone, D. W., Belmont County Medical Society.....Bellaire, 1890
Boone, Jos. S., Belmont County Medical Society, Powhatan Point, 1892
Bowen, A. H., Academy of Medicine.....Columbus, 1878
Boylan, A. (Union County).....Milford Center, 1878
Boyd, James P., N. E. O. M. A.....Akron, 1892
Brady, M. B., Academy of Medicine.....Cincinnati, 1892
Bramble, D. D.....Cincinnati, 1870
Brandenburg, F. D., Cuyahoga Co. Medical Society..Cleveland, 1892
Brannan, T. H., Tuscarawas Co. Medical Society..Canal Dover, 1884
Brashear, B. B., Cuyahoga County Medical Society..Cleveland, 1886
Brayton, Asa, N. W. O. M. A.....Carey, 1892
Brent, C. P., Academy of Medicine.....Cincinnati, 1892
BRICKER, W. R.....Shelby, 1848
Brigham, O. S., Toledo Medical Association.....Toledo, 1892
BRINKERHOFF, D. H., Sandusky Co. Med. Society..Fremont, 1853
Brockett, A. J.....Cleveland, 1874
Brown, H. M., Highland County Medical Society....Hillsboro, 1882
Brown, J. A.....Germantown, 1886
Brown, Joseph E., Academy of Medicine.....Cincinnati, 1892
Brown, J. E., Academy of Medicine.....Columbus, 1892
Brown, Warren B.....San Luis Obisbo, Cal., 1888
Bruehl, Gust., Academy of Medicine.....Cincinnati, 1892

Brundage, L. A., Greene County Medical Society-------Xenia, 1892
Brush, Edmund C., Hildreth District Med. Society--Zanesville, 1878
Buckingham, John M., Clarke Co. Medical Society--Springfield, 1885
BUCKNER, J. H., Academy of Medicine----------Cincinnati, 1863
Buechner, W. L., Mahoning Co. Medical Society----Cleveland, 1879
Bunce, W. C. ----------Oberlin, 1891
Bunn, Jas. W., Adams County Medical Society----West Union, 1872
Bunts, Frank E., Cuyahoga Co. Medical Society-----Cleveland, 1892
Butler, Geo. O.----------Cleveland, 1870
Butler, G. W. ----------Columbus, 1869
Caldwell, Jno. L., Pike County Medical Society ------Waverly, 1894
Caldwell, J. S., Academy of Medicine----------Cincinnati, 1892
Caldwell, William, Sandusky Co. Medical Society----Fremont, 1886
Calhoun, W. M., Union M. A. Columb. --------East Liverpool, 1892
Callinan, D. F., Academy of Medicine----------Columbus, 1892
Calvin, J. H., Erie County Medical Society----------Salem, 1891
Campbell, John, Crawford County Medical Society------Galion, 1891
Campbell, Oscar B., Cuyahoga Co. Medical Society--Cleveland, 1892
Carlisle, Irwin S., Cuyahoga Co. Medical Society-----Glenville, 1892
Carmichael, W. A., Miami Valley Med. Society------Loveland, 1871
Carpenter, E. G., Cuyahoga Co. Medical Society----Cleveland, 1892
Carpenter, Julia W., Academy of Medicine---------Cincinnati, 1879
Carrick, Anthony L., Academy of Medicine--------Cincinnati, 1871
Carroll, Thos. M., Clarke Co. Medical Society ------Springfield, 1892
Carrothers, M. M., Hancock Co. Medical Society------Findlay, 1892
Carson, Archibald I., Academy of Medicine--------Cincinnati, 1892
Carson, Frank D., Holmes County Medical Society----Benton, 1892
Case, Freeman D., Ashtabula County M. S----------Ashtabula, 1886
Chadwick, Leroy S., Cuyahoga Co. Med. Society----Cleveland, 1892
Chamberlin, Chas. S., Trumbull Co. Medical Society--Kinsman, 1892
Chamberlin, D. P., Toledo Medical Association---------Toledo, 1874
Chapman, Byron, N. E. O. M. A.----------Copley, 1885
Chapman, Wm. C., Toledo Medical Association--------Toledo, 1875
Chesney, John A., Crawford Co. Medical Society -----Bucyrus, 1892
Clark, C. F., Academy of Medicine----------Columbus, 1885
Clarke, Ida, Mahoning County Medical Society---Youngstown, 1889

Clark, Frank S., Cuyahoga County Medical Society--Cleveland, 1892
Clark, J. Ross, N. W. O. M. A.----------Bluffton, 1892
Clark, John H., Champaign Co. Med. Society--Mechanicsburg, 1869
Clark, J. N., Fayette County Medical Society----Madison Mills, 1892
Clark, Myron S., Mahoning Co. Medical Society--Youngstown, 1879
Cleaver, J. V., Summit County Medical Society---------Akron, 1892
Clouse, Geo. M., Academy of Medicine----------Columbus, 1892
Cobbs, Chas.----------New Athens, 1889
Coleman, N. R., Academy of Medicine----------Columbus, 1875
Coldham, Wm. W., Toledo Medical Association--------Toledo, 1892
Collamore, George A., Toledo Medical Association -----Toledo, 1880
Collins, Milton H., Clarke Co. Medical Society--So. Charleston, 1890
Collins, John W.----------Steubenville, 1894
Colville, George H. (Belmont County) ----------Harrisville, 1887
Combs, John S., Clermont County Medical Society--Owensville, 1892
Comyges, C. S., Academy of Medicine----------Cincinnati, 1892
Conklin, W. J., Montgomery Co. Medical Society------Dayton, 1868
Conard, George R., Clinton Co. Medical Society--New Vienna, 1890
Conden, John F., Miami County Medical Society------Morrow, 1892
Cone, J. E., Mahoning County Medical Society---Youngstown, 1889
Conn, Eli, Summit County Medical Society----------Akron, 1887
Conner, Phineas S., Academy of Medicine----------Cincinnati, 1868
Cook, G. F., Butler County Medical Society----------Oxford, 1885
Cook, Thomas M., Erie County Medical Society-----Sandusky, 1892
Cooper, Albert, Central Ohio Medical Society-------Columbus, 1881
Cooperrider, C. A., Academy of Medicine----------Columbus, 1892
Cope, A. L., Union County Medical Society---- -------Winona, 1892
Corbin, Lee, Montgomery County Medical Society-----Dayton, 1892
Corlett, Wm. T., Cuyahoga County Medical Society--Cleveland, 1882
Corson, O. M., Butler County Medical Society ----Middletown, 1879
Cosgrove, Thomas, Toledo Medical Association---------Toledo, 1892
Costello, J. W., Shelby County Medical Society-------Loramie, 1892
COTTON, J. D., Washington Co. Medical Society----Marietta, 1852
Courtright, Alva P.----------Circleville, 1871
Courtright; Geo. S. ----------Lithopolis, 1867
Cox, J. M., Ross County Medical Society---------South Salem, 1877

Craig, J. Harvey, North Central Ohio M. S. ---------Mansfield, 1886
Crane, A. M., Marion County Medical Society----------Marion, 1881
Craver, S. Belle, Toledo Medical Association ----------Toledo, 1892
Creps, Adolphus H., Allen County Medical Society West Minster, 1892
Crile, Geo. W., Cuyahoga County Medical Society---Cleveland, 1892
Crider, Chas. L., Muskingum Co. Medical Society---Zanesville, 1894
Crossland, Jeff. C., Muskingum Co. Med. Society----Zanesville, 1890
Crump, A. A., Jr., Holmes Co. Medical Society----Millersburg, 1892
Curry, John H., Toledo Medical Association----------Toledo, 1892
Curry, Frank C., Cincinnati Academy of Medicine-----Milford, 1892
Cushing, Edward F., Cuyahoga Co. Med. Society----Cleveland, 1892
CUSHING, H. K., Cuyahoga Co. Medical Society---Cleveland, 1857
Dandridge, N. Pendleton, Academy of Medicine ----Cincinnati, 1871
Davidson, N. P., Union County Medical Society -----Hilliards, 1890
Davison, Jno. F., Northern Ohio Med. Society---No. Amherst, 1893
Davis, J. T., Muskingum County Medical Society----Zanesville, 1892
Davis, Clark W., Academy of Medicine ----------Cincinnati, 1892
Death, H. J., Warren County Medical Society---------Franklin, 1892
DeCourcy, W. E., Academy of Medicine ----------Cincinnati, 1892
Deemer, H. E., Erie County Medical Society----------Castalia, 1892
Denman, Wm. C., Marion Co. Medical Society ----------Marion, 1882
De La Barre, Paul----------Port Clinton, 1892
DeVilbiss, Allen, Toledo Medical Association----------Toledo, 1887
Dick, W. L., Academy of Medicine----------Columbus, 1892
Dickey, Thos. A., Butler County Medical Society--Middletown, 1879
Dine, C. L., N. W. O. M. A. ----------Minster, 1893
Dixon, W. A., Brown County Medical Society----------Ripley, 1889
Dolina, T. F., Montgomery County Medical Society----Dayton, 1892
Donnelly, James, Toledo Medical Association----------Toledo, 1892
Donnellan, J. E.----------Germantown, 1879
Dorman, H. W., Ashtabula County Medical Society----Harbor, 1886
Dorschug, F. B., Academy of Medicine----------Cincinnati, 1892
Dorsey, Jos. F.----------Dresden, 1894
Downs, Samuel ----------Waterville, 1876
Dunlap, C. O----------Athens, 1881
Duncan, A. M., Crawford County Medical Society ----Bucyrus, 1886

Duncan, Jas. A., Toledo Medical Association----------Toledo, 1874
Dunham, W. H., Academy of Medicine ----------Cincinnati, 1892
Dunlap, Alex----------Springfield, 1854
Dutton, C. F., Cuyahoga County Medical Society----Cleveland, 1880
Eakins, John (Gallia County) ----------Patriot, 1894
Eckman, H----------Tuscarawas.
Eddy, Chas. W., Washington Co. Medical Society----Marietta, 1888
Eichberg, Jos , Academy of Medicine ----------Cincinnati, 1882
Ellsberry, W. W., Brown Co. Medical Society-----Georgetown, 1892
Ellsberry, A. M , Brown County Medical Society--Georgetown, 1892
Ely, J. S., Belmont County Medical Society--------Barnesville, 1892
Entrekin, F. W., Hancock County Medical Society----Findlay, 1892
Erwin, N. B., Sandusky County Medical Society---Gibsonburg, 1891
Esch, Jos. P., Erie County Medical Society----------Huron, 1892
Evans, A. E , Central Ohio Medical Society-------- Columbus, 1882
Evans, Otho, Warren County Medical Society--------Franklin, 1892
Evans, George B., Montgomery Co. Medical Society----Dayton, 1892
Everts, Orpheus, Academy of Medicine ----------Cincinnati, 1885
Everett, Abner B. (Lorain County) ----------Kipton, 1893
Ewing, M. J., Hancock County Medical Society-------Findlay, 1892
Faber, Chas. A., Toledo Medical Association----------Toledo, 1892
Fackler, John E. ----------Versailles, 1879
Fann, Geo. C., Erie County Medical Society ----Kelly's Island, 1892
Fassig, J. M., Muskingum County Medical Society--Zanesville, 1893
Fels, Geo. W., Academy of Medicine----------Cincinnati, 1892
Fella, F. J., Toledo Medical Association----------Toledo, 1892
Fisher, A. W., Toledo Medical Association----------Toledo, 1892
Fisher, W. H., Toledo Medical Association----------Toledo, 1892
Fisher, P.----------Cincinnati, 1892
Fitzpatrick, T. V., Academy of Medicine ----------Cincinnati, 1890
Fitzsimmons, J. F., Crawford Co. Medical Society-----Bucyrus, 1892
Fletcher, Mordecai H., Academy of Medicine-------Cincinnati, 1892
Flemming, J. C.----------Carlisle, 1892
Floyd, J. C. M., Jefferson Co. Medical Society----Steubenville, 1884
Foertmeyer, C. H., Academy of Medicine ----------Cincinnati, 1892
Fogel, L. J.----------Cincinnati, 1892

Foltz, Tobias H., N. W. O. M. A.----------Lima, 1892
Folk, Peter.----------Deavertown, 1894
Forchheimer, F., Academy of Medicine ----------Cincinnati, 1892
Formorin, J. L., Clermont County Medical Society--Marathon, 1892
FORBES, S. F., Toledo Medical Association----------Toledo, 1856
Foster, G. F., Ross County Medical Society---Kingston Centre, 1882
Foster, C. A., Fayette Co. Medical Society--Washington C. H , 1891
Fowler, Silas W.----------Delaware, 1873
Francis, A. W., Brown County Medical Society --------Ripley, 1892
Fraser, J. M., Cuyahoga County Medical Society----Cleveland, 1892
Fraunfalter, J. ----------Canton, 1886
Freeman, Leonard, Academy of Medicine ----------Cincinnati, 1892
French, Herbert W.----------Cincinnati, 1892
French, Jas. M., Academy of Medicine----------Cincinnati, 1892
FULLER, S. W.---------- Bellefontaine, 1853
Fullerton, Erskine B., Academy of Medicine--------Columbus, 1894
Gage, Rawson S , Washington Co. Medical Society-----Qualey, 1892
Gale, George T., Washington Co. Medical Society ----Newport, 1888
Galloway, C. M., Greene County Medical Society--------Xenia, 1888
Galloway, W. A., Greene County Medical Society--------Xenia, 1890
Gardiner, W. G., N. W. O. M. A.----------Toledo, 1892
Gaune, A. J., Erie County Medical Society----------Sandusky, 1870
GAY, N.----------Columbus, 1848
Gehritt, T. M., N. W. O. M. A.----------Deshler, 1892
Geyer, Jos. L., Muskingum County Medical Society--Norwich, 1892
Gibbon, H. B., N. W. O. M. A. ----------Tiffin, 1891
Gibson, Robert D., Mahoning Co. Med. Society --Youngstown, 1882
Gifford, Wm. R., Toledo Medical Association ----------Toledo, 1892
Gillette, Wm. J., Toledo Medical Association----------Toledo, 1892
Gilliam, D. Tod., Academy of Medicine ---------- ----Columbus, 1873
Goebel, Anna M., Allen County Medical Society----------Lima, 1892
Goetz, F. E., Cuyahoga County Medical Society ----Cleveland, 1892
Goodhue, Geo., Montgomery Co. Medical Society------Dayton, 1884
Goodson, John W.----------Sterling, 1874
Goode, B. P., Academy of Medicine----------Cincinnati, 1892
Gores, F. C., Academy of Medicine----------Cincinnati, 1892

Gordon, O. F., Cuyahoga County Medical Society ---Cleveland, 1892
Gordon, Patrick A.----------Junction City, 1894
GORDON, T. W., Brown Co. Medical Society ----Georgetown, 1849
Goss, J. H., Central Ohio Medical Society----------Lancaster, 1884
Graham, Jno. C., Academy of Medicine ----------Columbus, 1892
Graefe, Wm., Erie County Medical Society----------Sandusky, 1874
Graefe, Chas., Erie County Medical Society ----------Sandusky, 1891
Granger, Francis M., Highland Co. Medical Society----Russell, 1881
Gray, Francis C., Montgomery Co. Medical Society ----Dayton, 1894
Green, Henry S., (Morrow Co.) ----------Cardington, 1878
Greene, D. W., Montgomery Co. Medical Society------Dayton, 1882
Grimm, Adolf, Academy of Medicine ----------Cincinnati, 1892
Groves, J. E., Tuscarawas Co. Medical Society----Uhrichsville, 1884
Guerin, Z. F., Central Ohio Medical Society --------Columbus, 1884
Gue, Virgil H. (Perry County) ----------New Lexington, 1894
Guerin, L. T., Columbus Medical Club - - --------Columbus, 1888
Hahn, H. H., Mahoning County Medical Society--Youngstown, 1892
Haldeman, Jno. S., Muskingum Co. Med. Society---Zanesville, 1885
Hall, Willis W., Clarke County Medical Society----Springfield, 1882
Hall, Rufus B., Academy of Medicine----------Cincinnati, 1884
Hall, C. T., Warren County Medical Society----------Mason, 1892
Hamilton, Horatio A., Wood Co. Medical Society--Perrysburg, 1886
Hamilton, W. D., Academy of Medicine ----------Columbus, 1886
Hamilton, C. S., Academy of Medicine----------Columbus, 1891
HAMILTON, J. W., Academy of Medicine---------Columbus, 1849
Hancock, W. D., Butler County Medical Society------Melville, 1892
Hart, Romeyn B., Jr., Washington Co. Med. Society--Marietta, 1892
Hartman, Geo. W., N. W. O. M. A.----------Wauseon, 1887
Hartman, S. D., Miami Co. Medical Society---Tippecanoe City, 1874
Hardy, Martin V., Washington Co Med. Society-----Marietta, 1892
Hart, Samuel, Washington Co. Medical Society-------Marietta, 1887
Hardy, John C., Washington Co. Medical Society ---Marietta, 1886
Harrison, E. B., N. W. O. M. A. ----------Napoleon, 1869
HARMON, JULIAN, Trumbull Co. Med. Society-----Warren, 1857
HART, B. F., Washington Co. Medical Society------Marietta, 1854
Hasencamp, Oscar, Toledo Medical Association --------Toledo, 1891

Hathaway, Harrison, Toledo Medical Association--East Toledo, 1874
Hatch, Chas. A. ----------Newark, 1893
Hawley, Edwin P., Cuyahoga Co. Medical Society --Cleveland, 1892
Haynes, J. T., Erie County Medical Society---------Sandusky, 1893
Haynes, J. Purcell, Toledo Medical Association--------Toledo, 1892
Heaton, Townsend, Academy of Medicine ----------Aberdeen, 1892
Heard, Eugene N., N. W. O. M. A.-- ----------Sandusky, 1892
Heiter, Carl, Erie County Medical Society ----------Sandusky, 1875
Heidrick, Louis W., Toledo Medical Association--------Toledo, 1892
Helmick, G. W. (Franklin County) ----------Harrisonburg, 1878
HENDERSON, D. W. ----------Marysville, 1856
Henderson, Robert, Champaign Co. Medical Society---Urbana, 1892
Henderson, Geo. W., N. W. O. M. A.----------Vaughansville, 1892
Henderson, H. E., Cuyahoga Co. Medical Society---Cleveland, 1892
Hendly, F. W., Academy of Medicine----------Cincinnati, 1892
Henry, A. G., N. W. O. M. A. ----------North Baltimore, 1892
Hendrixson, Hugh, Academy of Medicine----------Columbus, 1868
Herrick, H. J., Cuyahoga Co. Medical Society ------Cleveland, 1868
Hersh, E. G., Hancock County Medical Society ------McComb, 1892
Hewetson, Alex. H. (Belmont County)----------St. Clairsville, 1894
Hiestand, E. B., N. W. O. M. A.----------Kenton, 1884
Hiddleson, O. S., Portage County Medical Society ----Atwater, 1888
Hillbish, Fred. S. ----------Fremont, 1878
Hill, Frank E., Clemont Co. Med. Society----Mt. Auburn, Ky., 1892
Hill, Wm. W., Wood County Medical Society ----------Weston, 1892
Hill, N. S., Clermont County Medical Society,----------Neville, 1866
Hillhowitz, Wm., Academy of Medicine----------Cincinnati, 1892
Himes, Isaac N., Cuyahoga Co. Medical Society-----Cleveland, 1877
Hines, J. Arthur----------Van Wert, 1879
Hiner, S. B., Allen County Medical Society ----------Lima, 1874
Hinckley, H. D., Butler County Medical Society-------Oxford, 1887
Hintzelman, C., Cuyahoga County Medical Society--Cleveland, 1892
Hipple, J. R. (Marion County) ----------Waldo, 1881
Hise, A. H., N. C. O. M. S.----------New Washington, 1890
Hixon, M. M., N. W. O. M A.----------Dupont, 1887
Hobbs, Wilbert A., Union Co. Med. Society ----East Liverpool, 1889

Hobson, John A., Belmont Co. Medical Society——Flushing, 1891
Hoeltge, A. E., Academy of Medicine ——Cincinnati, 1892
Hoff, Jos. W., Meigs County Medical Society ——Pomeroy, 1872
Holliday, W. W., Cuyahoga Co. Medical Society——Cleveland, 1892
Holliday, Benj. W., Cuyahoga Co. Medical Society—Cleveland, 1875
Holcomb, Leroy S.——Pennville, 1894
Holdren, G. W., Fayette Co. Medical Society —Bloomingburg, 1892
Holmes, C. R., Academy of Medicine——Cincinnati, 1892
Holston, J. G. F., Muskingum Co. Medical Society—Zanesville, 1892
Hoover, Collins M., Union Medical Society——Alliance, 1885
Hoover, Thos. C. Academy of Medicine ——Columbus, 1891
Hoover, Albert, N. E. O. M. S. ——Akron, 1892
Hoppe, H. H., Academy of Medicine ——Cincinnati, 1892
Hottendorf, Louis P., Academy of Medicine——Cincinnati, 1892
Hous, Geo. W., Montgomery Co. Medical Society——Clayton, 1892
Hough, C. A., Warren County Medical Society——Lebanon, 1890
Hough, Wayland S., Summit Co. Med. Society—Cuyahoga Falls, 1875
House, A. F.—— Cleveland, 1880
Howell, J. Morton, Fayette Co. Med. Society—Washington C. H., 1892
Hubbard, Thomas, Toledo Medical Association——Toledo, 1889
Hudson, J. F., N. E. O. M. A.——Canton, 1892
Hughes, F. M.——Vermillion, 1892
Hughey, J. W. (Fayette County) ——Chillicothe, 1892
Humphrey, J. B., Muskingum Co. Medical Society—Zanesville, 1894
Humiston, Wm. H., Cuyahoga Co. Medical Society—Cleveland, 1880
Humphrey, C. H., Montgomery Co. Medical Society—Dayton, 1892
Hunt, A. H.——Wooster, 1892
Hurd, A., Hancock County Medical Society ——Findlay, 1870
Hussey, M. F., Shelby County Medical Society——Sidney, 1892
HYATT, E. H. ——Delaware, 1862
Iddings, A. H. ——Dayton, 1879
Ikirt, G. P. (Champaign County) ——East Liverpool, 1882
Ireland, W. E., Fayette Co. Medical Society—Washington C. H., 1887
Ireland, S. A., Fayette Co. Medical Society—Washington C. H., 1892
Ireton, E. C.——Columbus, 1892
Jacobs, Harold H., N. E. O. M. A.——Akron, 1892

Jacobs, W. C.----------Akron, 1892
James, A. D.----------Mt. Gilead, 1891
Jennings, Ellis, Montgomery Co. Medical Society------Dayton, 1867
Jenks, Wm. O., Cuyahoga County Medical Society-Nottingham, 1892
Jennings, G., Miami County Medical Society-----West Milton, 1892
Jewett, H. S., Montgomery County Medical Society----Dayton, 1871
Johnson, O , Central Ohio Medical Society--------Worthington, 1878
Johnston, C. E., Shelby County Medical Society--------Sidney, 1892
Jones, Wm. A. ----------Toledo, 1892
Jones, L. M., Greene County Medical Society------Jamestown, 1892
Jones, J. D., Cuyahoga County Medical Society -----Cleveland, 1870
Jones, Geo. E., Academy of Medicine----------Cincinnati, 1892
JONES, R. E., N. W. O. M. A.--------- ----------Gomer, 1863
Jones, Toland, Central Ohio Medical Society----------London, 1878
JONES, T. W.----------Columbus, 1847
Joseph, Leopold, Academy of Medicine----------Cincinnati, 1892
Judkins, Wm., Academy of Medicine ----------Cincinnati, 1892
Judkins, C. P., Academy of Medicine----------Cincinnati, 1887
Judkins, Jas. A.----------Barnesville, 1894
Junkerman, Geo. S., Academy of Medicine---------Cincinnati, 1892
Kaestlen, Samuel E., Cuyahoga Co. Medical Society--Cleveland, 1892
Kammann, Albert A., Academy of Medicine----Cincinnati, 1892
Kautz, J. W., Brown County Medical Society--------Arnheim, 1892
KAY, ISAAC, Clarke County Medical Society-----Springfield, 1853
Keck, Peter A., Academy of Medicine----------Cincinnati, 1892
Kelley, H. R. ---------- Galion, 1868
Keller, B. T., Fayette Co. Medical Society ------Bloomingburg, 1891
Kemp, Lucia, Crawford County Medical Society------Bucyrus, 1892
Kendig, Elias V., Ashland County Medical Society--Hayesville, 1874
Kerns, J. T. Walpole, E. O. M. S.----------Bellaire, 1892
Kiely, W. E., Academy of Medicine----------Cincinnati, 1892
KINSMAN, D. N., Academy of Medicine----------Columbus, 1864
Kinnell, J. A., Hancock County Medical Society------Findlay, 1892
King, Jno I.----------Huntington, Ind., 1884
King, J. R., Academy of Medicine ----------Cincinnati, 1892
Kirkley, Cyrus A., Toledo Medical Association--------Toledo, 1874

Kishler, Washington G. ----------St. Marys, 1892
Kitchen, Francis A., Toledo Medical Association -------Toledo, 1892
Knowlton, W. A.----------Cleveland, 1892
Koehler, Max, Academy of Medicine----------Cincinnati, 1893
Kolb, Matthew G., Cuyahoga Co. Medical Society---Cleveland, 1892
Krause, B., Cuyahoga County Medical Society ------Cleveland, 1880
Kramer, F. H., Academy of Medicine----------Cincinnati, 1892
Krause, L. S., Montgomery Co. Medical Society--W. Carrollton, 1892
Kreiger, Gustave S.----------Madisonville, 1884
Kreider, C. L., Erie County Medical Society ------Monroeville, 1892
Krouse, Louis J., Academy of Medicine----------Cincinnati, 1892
Kurtz, C. E.----------4460 Berkeley Avenue, Chicago, 1875
Landman, Otto, Toledo Medical Association----------Toledo, 1892
Langdon, F. W., Academy of Medicine----------Cincinnati, 1892
LANDON, C. P., Central Ohio Medical Society ---Westerville, 1851
Larimore, F. C., N. C. O. M. S.----------Mt. Vernon, 1871
Lash, Josiah W., Ross County Medical Society -----Chillicothe, 1879
Lathrop, Arthur B., N. W. O. M. A. ----------Swanton, 1887
Lawless, James T., Toledo Medical Association --------Toledo, 1887
Lawrence, F. F., Academy of Medicine----------Columbus, 1888
Leach, Sherman ----------Mt. Sterling, 1888
Leahy, Maurice ----------Tiffin, 1891
Lee, J. L., N. E. O. M. A.----------Akron, 1892
Le Fevre, Edwin, Shelby County Medical Society------Sidney, 1891
Leich, G. F., Cuyahoga County Medical Society-----Cleveland, 1892
Lenhart, Charles M.----------Zanesville, 1894
Leonard, W. W.----------Delaware, 1891
LEONARD, B. B., N. W. O. M. A.----------West Liberty, 1854
Leslie, J. M., Ross County Medical Society --------Chillicothe, 1878
Lewis, W. C. (Fairfield County) ----------Rushville, 1869
Lichliter, David C., Montgomery Co. Med. Society-----Dayton, 1892
Lightner, S. B., Clinton County Medical Society--------Sabina, 1888
Longfellow, R. C., Academy of Medicine ----------Cincinnati, 1892
Love, Ephraim W., Brown Co. Medical Society ---Fayetteville, 1892
LOVING, STARLING, Academy of Medicine------Columbus, 1858
Lowman, J. H., Cuyahoga County Medical Society--Cleveland, 1877

Lucas, V. C., Cuyahoga County Medical Society ----Cleveland, 1892
Lyle, Benj. F., Academy of Medicine----------Cincinnati, 1892
LYMAN, C. N., N. E. O. M. A. ----------Wadsworth, 1852
McClure, J. A. ---------- ----------Columbus, 1892
McClure, James, Washington Co. Medical Society-----Marietta, 1866
McClung, John C., N. W. O. M. A.----------Leipsic, 1887
McClintock, Samuel.---------- ------Mt. Sterling, 1890
McCollum, E. J., N. W. O. M. A.----------Tiffin, 1871
McCoy, Clem. D., N. W. O. M. A. ----------Kenton, 1892
McCurdy, S. L., Tuscarawas Co. Medical Society-----Dennison, 1882
McCurdy, John, Mahoning Co. Medical Society---Youngstown, 1870
McCullough, Jos. A.----------Steubenville, 1894
McClellan, J. S., Belmont County Medical Society-----Bellaire, 1894
McDougal, Jno. G., Hildreth District M. A.----New Lexington, 1894
McGee, John B., Cuyahoga Co. Medical Society-----Cleveland, 1880
McGavren, Geo. W., N. W. O. M. A. ----------Van Wert, 1892
McGavran, Samuel B. ----------Cadiz, 1887
McIntire, Wm., Central Ohio Medical Society----Warrensburg, 1881
McILHENNY, J. J.----------Dayton, 1847
McKee, Edward S., Academy of Medicine----------Cincinnati, 1886
McKinley, E. Burris, N. W. O. M. A.----------Vaughnsville, 1887
McKecknie, Josiah B., Clinton Co. Medical Society--Cincinnati, 1892
McLean, J. T., Tuscarawas Co. Med. Society--New Philadelphia. 1884
McMurray, A. B.----------Marion, 1879
McQuaide, Thos. L. (Guernsey County) ----------Cambridge, 1894
Macready, James, Butler County Medical Society------Monroe, 1885
Mackenzie, J. C., Academy of Medicine----------Cincinnati, 1892
Mack, John ----------Shelby, 1853
Maerker, A. E. H., N. W. O. M. A.----------Napoleon, 1892
Marquart, Oscar M., Greene Co. Medical Society-------Osborn, 1891
Marris, Joseph----------Columbus Grove, 1892
Markley, Lee, Brown County Medical Society-----Georgetown, 1892
Martin, Jas., N. E. O. M. A. (Wayne County)---Fredericksburg, 1892
Marshall, W. C., Montgomery Co. Medical Society---Trotwood, 1892
Martin, John T., Marion County Medical Society------Marion, 1884
Martin, John C., Hancock County Medical Society----Findlay, 1887

Marsh, F. O., Academy of Medicine----------Cincinnati, 1892
Marquis, Thos. B., N. E. O. M. A. ----------New Lisbon, 1892
Marshall, S. A----------Jeffersonville, 1889
Mattoon, F. N. (Madison County).----------Plain City, 1881
Matthias, A. C., N. W. O. M. A.----------Gilboa, 1892
Maynard, O. T.----------Elyria, 1892
May, John B.----------New Holland, 1892
Means, W. J., Central Ohio Medical Society---------Columbus, 1892
Melick, Wm. A., Muskingum Co. Medical Society---Zanesville, 1892
Merriman, D. J., Portage County Medical Society--Painesville, 1884
Merriam, E. D., Ashtabula Co. Medical Society------Conneaut, 1884
Merriman, Georgia----------Bucyrus, 1892
Merz, Chas. H., Erie County Medical Society--------Sandusky, 1891
Metzler, Abraham S., Holmes Co. Medical Society------Baltic, 1874
Mills, J. T., Central Ohio Medical Society ----------Jersey, 1878
Milholland, Wm., Shelby County Medical Society------Sidney, 1892
Miller, John F., Shelby County Medical Society--Port Jefferson, 1892
Miller, T. Clarke, N. E. O. M. A.----------Massillon, 1893
Miller, Delbert J., Union County Medical Society---N. Benton, 1892
Miller, A. T., Tuscarawas Co. Medical Society------Shanesville, 1890
Milliken, Daniel, Butler County Medical Society ----Hamilton, 1879
Milliken, B. L., Cuyahoga Co. Medical Society ------Cleveland, 1885
Mills, C. H., N. W. O. M. S.----------Toledo, 1888
Mitchell, E. W., Academy of Medicine, Cincinnati--Avondale, 1892
Moncrief, David L., Wayne County Medical Society----Orville, 1892
Moody, Milo M., Union Co. Medical Society--Chatham Center, 1892
Moore, Lyman G., Trumbull Co. Medical Society ----Kinsman, 1878
Moore, H. M. W., Academy of Medicine----------Columbus, 1894
Mory, J. J. ----------St. Henrys, 1871
Morehouse, G. W.----------Sparta, 1890
MORRIS, JONATHAN (Lawrence County)----------Ironton, 1853
Morris, Joseph, N. W. O. M. A.----------Columbus Grove, 1879
Mosgrove, J. M., Champaign Co. Medical Society------Urbana, 1884
MOUNTS, LEONARD, Warren Co. Med. Society-----Morrow, 1860
Munn, H. E., N. W. O. M. A.----------Toledo, 1892
Murphy, John A., Academy of Medicine----------Cincinnati, 1872

Murphy, Jno. W., Academy of Medicine----------Cincinnati, 1892
Murbach, Andrew J., N. W. O. M. A.----------Archbald, 1874
Murray, Landon S., N. E. O. M. A. ----------Medina, 1890
Myers, Noah, Clarke County Medical Society ------Springfield, 1892
Myers, I. A., N. C. O. M. S.----------Shelby, 1892
Myers, J. E., Clarke County Medical Society-------Springfield, 1892
Nash, E. King (Summit County) ----------Montrose, 1876
Nau, J. G. (Fairfield County)----------Carroll, 1878
Neil, Alexander---------- Columbus, 1868
Nelson, J. W., Clarke County Medical Society -----Springfield, 1892
Noble, N. T.----------St. Marys, 1892
Noble, Herbert E., N. W. O. M. A.----------Stony Ridge, 1892
Noble, Chas. D.----------Oberlin, 1893
Norris, Thos. B (Franklin County) ----------Alton, 1882
North, John, Toledo Medical Association----------Toledo, 1891
Norton, F. B., Cuyahoga County Medical Society----Cleveland, 1892
Noyes, H. J., Hildreth District M. A.----------McConnellsville, 1888
Nunemaker, H. B.--------440 Market Street, Philadelphia, Pa., 1875
Oglesbee, Wm. E., Warren Co. Medical Society ---Waynesville, 1892
Oliver, J. C. Academy of Medicine ----------Cincinnati, 1892
Olmstead, D. S., Holmes County Medical Society--Millersburg, 1892
Osborn, Mary E.----------Canton, 1892
Oster, L. W., Cuyahoga County Medical Society ----Cleveland, 1892
Owsley, J. B., Butler County Medical Society-----Jacksonburg, 1871
Overly, Jno. E., Central Ohio Medical Society------Columbus, 1888
Palmer, Chauncey D., Academy of Medicine--------Cincinnati, 1871
PATTERSON, A. V.----------Mansfield, 1861
Patrick, Nathan E., Muskingum Co. Med. Society---Zanesville, 1894
PEARCE, Enoch----------Steubenville, 1859
Peck, G. S., Mahoning County Medical Society----Youngstown, 1891
Pennell, W. W.---- ---------- Fredericktown, 1884
Perkins, D. S., Cuyahoga County Medical Society---Cleveland, 1892
Peskind, Arnold, C. C. M. S.----------Cleveland, 1892
Peter, Robert, Tuscarawas Co. Medical Society----Canal Dover, 1891
Petitt, Richard R., Montgomery Co. Medical Society----Dayton, 1885
Piper, Wm., Belmont County Medical Society----------Bellaire, 1892

Porter, W. D., Academy of Medicine----------Cincinnati, 1892
Potter, S. B.----------Frederickstown, 1892
Potter, Nathan, Ross County Medical Society--------- Adelphi, 1890
Potts, Chas. N., Allen County Medical Society----------Lima, 1892
Powell, Wm. S.----------Defiance, 1881
Powell, J. E., Hancock County Medical Society--------Findlay, 1892
PRICE, JOSEPH, Portage County Medical Society--Randolph, 1852
Prior, Amelia J., Academy of Medicine ----------Cincinnati, 1892
Probst, C. O., Central Ohio Medical Society---------Columbus, 1892
Pugh, Frank H., N. W. O. M. A., Toledo State Hospital-Toledo, 1892
Querner, Louis A., Academy of Medicine----------Cincinnati, 1892
Quirk, Howard W., Cuyahoga Co. Medical Society--Cleveland, 1889
Quinn, Allen T., Clinton Co. Medical Society-----Wilmington, 1881
Rambo, Cyrus M., Muskingum Co. Med. Society----Zanesville, 1894
Rankin, Theo. W., Academy of Medicine----------Columbus, 1881
Ransohoff, Joseph, Academy of Medicine----------Cincinnati, 1879
Rardin, Joseph S.----------Portsmouth, 1892
Ravogli, Augustus, Academy of Medicine----------Cincinnati, 1892
REAMY, THAD. A., Academy of Medicine ------- Cincinnati, 1855
Reed, Calvin H., Toledo Medical Association----------Toledo, 1873
Reed, R. Harvey, N. C. O. M. A. ----------Columbus, 1884
Reed, T. J.----------Massillon, 1881
Reed, Chas. A. L., Academy of Medicine----------Cincinnati, 1881
Reemelin, R. H., Academy of Medicine ----------Cincinnati, 1892
REEVE, J. C., Montgomery Co. Med. Society---------Dayton, 1861
Reeve, J. C., Jr., Montgomery Co. Med. Society---------Dayton, 1892
Reif, Chas. F.----------Fremont, 1892
Reinhart, James C., Toledo Medical Association---------Toledo, 1887
Reinfrank, J. H., N. W. O. M. A ----------Perrysburg, 1886
Renneker, A. P.---------- -----Maria Stein, 1892
Rhu, Aug., Marion County Medical Society----------Marion, 1886
Rice, W. E.----------Tuscola, Ill., 1892
Richardson, Alonzo B., Academy of Medicine-------Columbus, 1891
Ricketts, Jos. V., Academy of Medicine----------Cincinnati, 1892
Ricketts, B. M., Academy of Medicine ----------Cincinnati, 1884
Ricketts, E. Irvin, Academy of Medicine---------- Cincinnati, 1882

Ridgeway, N. B., N. C. M. S.----------Galion, 1878
Riggs, J. M.----------Bryan, 1873
ROBINSON, JAMES D., Wayne Co. Med. Society----Wooster, 1856
Roberds, T. W., Highland County Medical Society----Sardinia, 1892
Rodebaugh, Henry A.----------Marysville, 1890
Rodgers, J. H.----------Louisville, 1889
Rogers, H. W., Cuyahoga County Medical Society---Cleveland, 1892
ROGERS, J. H., Clarke County Medical Society---Springfield, 1859
Romspert, J. A., Montgomery Co. Med. S.-----Dayton Asylum, 1892
Root, H. A., Toledo Medical Association----------Toledo, ----
Rosenwasser, M., Cuyahoga Co. Medical Society---- Cleveland, 1880
Rosenfeld, A., Academy of Medicine----------Cincinnati, 1892
Rosengrant, Thos. S.----------Batesville, 1894
Roulet, Chas., Toledo Medical Association----------Toledo, 1892
Row, Geo. T., Pickaway County Medical Society----Circleville, 1881
Rowles, W. T., Academy of Medicine----------Columbus, 1888
Rudy, A. S., Allen County Medical Society----------Lima, 1892
Ruess, Henry A., N. C. O. M. S----------Mansfield, 1892
Russell, E. S., Tuscarawas Co. Medical Society----Tuscarawas, 1880
Russell, Geo. C., Cuyahoga Co. Medical Society-----Cleveland, 1892
Ryan, Geo. W., Academy of Medicine----------Cincinnati, 1884
Sabin, Thos. M., Trumbull Co. Medical Society-------Warren, 1893
Sager, Jos., N. W. O. M. A.----------Celina, 1882
Santee, Leon B , Stark Co. Medical Society-------Marlborough, 1885
Sattler, Robert, Academy of Medicine----------Cincinnati, 1872
Sawyer, J. P., Cuyahoga County Medical Society---Cleveland, 1892
Sawyer, P. H., Cuyahoga County Medical Society---Cleveland, 1892
Schnetzler, H. Marcus, Toledo Medical Association-----Toledo, 1874
Schwab, Louis, Academy of Medicine----------Cincinnati, 1892
Schwab, Emanuel, Academy of Medicine ----------Cincinnati, 1892
Schutzbach, J. C., Tuscarawas Co. Medical Society--Strasburg, 1892
Schooley, Lindley----------Belmont, 1894
Schueller, J. B., Central Ohio Medical Society------Columbus, 1869
Scott, B. B., Knox County Medical Society--------Mt. Vernon, 1892
Scott, N. Stone, Cuyahoga County Medical Society--Cleveland, 1892
SCOTT, WM. J., Cuyahoga County M. S----------Cleveland, 1855

Scott, Wm. Alfred (Fulton County)----------Swanton, 1878
Scott, X. C., N. E. O. M. A. ----------Cleveland, 1874
SCOVILLE, S. S., Warren County Medical Society---Lebanon, 1859
Sears, O. T., Erie County Medical Society----------Put-in-Bay, 1892
Seeley, W. W., Academy of Medicine----------Cincinnati, 1871
Sittel, Theo., Academy of Medicine----------Cincinnati, 1892
Sewell, S. G., Greene County Medical Society--New Burlington, 1892
Shaw, Wm. E., Academy of Medicine----------Cincinnati, 1892
Shaller, John M., Academy of Medicine----------Cincinnati, 1892
Shalliott, Peter, Tuscarawas Co. M. S----------Winesburg, 1891
Sharp, Amos W., Central O. M. S----------Columbus, 1892
Sharp, B. M., Shelby County Medical Society----------Sidney, 1885
Sheldon, S. B., Brown County Medical Society------Five Mile, 1882
Sherman, H. G., Cuyahoga County Medical Society--Cleveland, 1892
Shumard, C.----------Station C, Cincinnati, 1892
Sihler, Chr., Cuyahoga County Medical Society-----Cleveland, 1892
Silver, D. R., Shelby County Medical Society----------Sidney, 1870
SINNETT, E., Licking County Medical Society-----Granville, 1850
Sipher, J. N., Cuyahoga County Medical Society----Cleveland, 1892
Sisler, Lewis E., N. W. O. M. A----------Clinton, 1887
Skeel, R. E., Cuyahoga County Medical Society----Cleveland, 1892
Slocum, Chas E., N. W. O. M. A----------Defiance, 1874
Smith, Wm. G., Portage County Medical Society-----Ravenna, 1885
Smith, H. H ----------Lexington, 1892
Smith, J. M. (Tuscarawas) ----------New Philadelphia, 1884
Smith, Chas. N., Toledo Medical Association----------Toledo, 1887
Smith, D. B., Cuyahoga County Medical Society----Cleveland, 1892
Snodgrass, Jessie, N. W. O. M. A----------Kenton, 1887
Snow, L. B., Cuyahoga County Medical Society-----Cleveland, 1892
SNYDER, D. J. (Harrison Co.) ----------Scio, 1850
Snyder, D. P. (Coshocton Co.)----------New Bedford, 1882
Somerville, G. H. Cuyahoga County Medical Society--Cleveland, 1892
Southard, John Q----------Marysville, 1882
Souders, Samuel, Montgomery County M. S----------Dean, 1879
Souders, R. L., N. W. O. M. A.---------(Wyandot Co.) Nevada, 1892
Spence, J. A. (Wellsville) ----------Pittsburgh, Pa., 1888

Speidel, C. G. E., Academy of Medicine----------Cincinnati, 1892
Sperry, Willis, N. E. O. M. S. ----------Tallmadge, 1886
Spencer, E. R., N. E. O. M. S. ---------- ----------Doylestown, 1885
Spiers, H. H.----------Ravenna, 1892
Stanton, Byron, Academy of Medicine----------Cincinnati, 1892
Straight, Howard S., Cuyahoga Co. Medical Society. Cleveland, 1892
Stansell, J. A.----------Forrest, 1866
Stamm, M., Sandusky County Medical Society-------Fremont, 1891
Stark, Sigmar, Academy of Medicine----------Cincinnati, 1892
Stanley, E.----------Sandusky, 1870
Stein, G. S., Academy of Medicine----------Columbus, 1888
Steiner. D. W., Allen County Medical Society----------Lima, 1890
Stewart, Jno. O., Greene County Medical Society----Cedarville, 1892
Stewart, Wm. D., Toledo Medical Association----------Toledo, 1887
Stewart, Thos. H., Trumbull Co. Medical Society--Church Hill, 1877
Stewart, Robt. W., Academy of Medicine----------Cincinnati, 1892
STEPHENS, E. B., Warren County Medical Society--Lebanon, 1853
Stephenson, Y., Brown County Medical Society---Georgetown, 1892
Stevenson, Geo. W., Cuyahoga Co. Medical Society--Cleveland, 1892
Stevens, M. B., N. W. O. M. A.----------Defiance, 1887
Stevens, E. S., Warren County Medical Society------ Lebanon, 1886
STILLWELL, THOS., Sandusky Co. Med. Society----Fremont, 1857
Stinson, Chas. H.----------Newark, 1894
Storey, Wm., Erie County Medical Society----------Castalia, 1884
STOCKSTILL, J. N. (Clarke County).----------New Carlisle, 1857
Sudhoff, Geo. F., Academy of Medicine----------Cincinnati, 1892
Sutton, H. T., Musk. County Medical Society--------Zanesville, 1894
SWENEY, R. L.----------Marion, 1859
Sykora, J., Cuyahoga County Medical Society-------Cleveland, 1892
Szendery, L. S.----------Castroville, Medina County, Texas, 1887
Taft, Jonathan, Academy of Medicine ----------Cincinnati, 1892
Taggart, H. D., Summit County Medical Society--------Akron, 1892
Tangeman, C. W., Academy of Medicine----------Cincinnati, 1888
Tate, Geo. M----------Botkins, 1892
Taylor, Wm. H., Academy of Medicine----------Cincinnati, 1874
Taylor, H. L ----------Asheville, N. C., 1888

Taylor, Clovis M.----------Columbus, 1894
Telfair, Geo. M. (Clinton County)----------Bloomington, 1884
Templeton, A. M., Musk. County Medical Society---Zanesville, 1892
Templeton, B. F., Musk. County Medical Society ---Zanesville, 1892
Thomas, Frank W., Marion County Medical Society ---Marion, 1884
Thompson, J. A., Academy of Medicine----------Cincinnati, 1892
Thompson, S. R., Tuscarawas Co. Medical Society, Uhrichsville, 1892
Thorn, S. S., Toledo Medical Association----------Toledo, 1873
Thorner, Max., Academy of Medicine ----------Cincinnati, 1892
Thrasher, A. B., Academy of Medicine ----------Cincinnati, 1876
Tichenor, E. J., Warren County Medical Society-----Lebanon, 1869
Titus, A., Hempstead M. A. of M----------Portsmouth, 1885
Titlow, Benatta D., Clarke County Medical Society, Springfield, 1892
Tobey, Henry A., Toledo M. A----------State Hosp., Toledo, 1878
Todd, Fred. A., Toledo Med. Association---State Hosp., Toledo, 1892
Todd, J. H., Wayne County Medical Society----------Wooster, 1892
Tracy, Jas. L., Toledo Medical Association----------Toledo, 1892
Trimble, C. E., Crawford County Medical Society----Crestline, 1892
Trimble, R. T., Clinton County Medical Society --New Vienna, 1881
Trush, J., Academy of Medicine ----------Cincinnati, 1892
Tuckerman, L. B., Cuyahoga County Medical Society, Cleveland, 1891
Tydings, O., Piqua Soc. Clin. Med. ----------Piqua, 1892
Upson, Henry S., Cuyahoga Co. Medical Society-----Cleveland, 1888
Vail, D. T., Academy of Medicine----------Cincinnati, 1892
Vance, R. A., Cuyahoga County M. S----------Cleveland, 1881
VANDERVOORT, J. W., Warren Co. Med. So.--Harveysburg, 1864
Van Pelt, Chas. L., Toledo Medical Association--------Toledo, 1887
Van Nette, Wesley, Crawford Co. Medical Society------Poplar, 1892
VANNATA, E. (Muskingum County)----------Fultonham, 1855
Vigor, F. A. (Fayette County)----------Good Hope, 1884
Vogt, D. F., Cuyahoga Co. Medical Society- ----------Cleveland, 1891
Von Klein, C. H., N. E. O. M. A----------Cleveland, 1891
Vorhies, Elmer E.----------Cambridge, 1894
Wadsworth, Miner----------Hoytsville, 1892
Waggoner, Joseph, Portage County Medical Society--Ravenna, 1870
Wagner, Henry P., N. W. O. M. A.----------Delphos, 1892

Wagenhals, F. W., Columbus Medical Club.....Columbus, 1885
Walker, Alonzo B., Union Medical Society .....Canton, 1882
Ward, Wadsworth A., Ashtabula Co. Med. Society..Conneaut, 1880
Warner, Frank, Academy of Medicine.....Columbus, 1884
Warner, C. J., N. C. O. M. S.....Congress, 1892
Ward, C. L., N. W. O. M. A.....Cridersville, 1891
Ward, Clarence S., Trumbull Co. Med. S.....Warren, 1875
Ward, Orin W.....Duncan's Falls, 1894
Watson, G. N., Cuyahoga County Medical Society...Cleveland, 1892
Weaver, J. M., Montgomery County Medical Society...Dayton, 1865
Webber, Wm. C., Cuyahoga Co. Medical Society....Cleveland, 1892
Webster, J. V., Belmont County Medical Society.....Flushing, 1890
Weed, Theo. A.....Cleveland, 1880
Weeks, O. W., Marion County Medical Society.....Marion, 1884
Welsh, Absalom J., Fayette County M. S.....Mt. Sterling, 1890
Wells, Winfield S., Marion County Medical Society....Marion, 1892
Wenning, W. H., Academy of Medicine.....Cincinnati, 1892
West, T. J., N. W. O. M. A.....Tiffin, 1875
West, J. P., Belmont County Medical Society.....Bellaire, 1892
Whittaker, J. F., Jefferson County M. S.....Bloomingdale, 1892
Whitmer, J. E.....Millersburg, 1892
Whittaker, John T., Academy of Medicine.....Cincinnati, 1871
White, G. M., Academy of Medicine.....Columbus, 1888
Wilson, D. C.....Ironton, 1872
Willson, Wm. H. (Adams County).....Greenfield, 1865
Williams, Brady O., Eastern Ohio M. S.....Martin's Ferry, 1891
Williard, G. P., N. W. O. M. A.....Tiffin, 1875
Williamson, A. M., Montgomery County M. S.....Dayton, 1892
Williams, T. B., Cuyahoga Co. Medical Society.....Cleveland, 1886
Williams, J. L.....Delaware, 1878
Wilson, J. L., Highland County Medical Society...Greenfield, 1871
Williamson, M. S., Hancock County Medical Society...Findlay, 1891
Wirth, R., Academy of Medicine.....Columbus, 1886
Wirt, Wm. E., Cuyahoga Co. Medical Society.....Cleveland, 1891
Wiseman, Osbourne M., Muskingum Co. Med. So...Zanesville, 1894
Withrow, J. M., Academy of Medicine.....Cincinnati, 1892

Wolfenstein, Julius, Cuyahoga Co. Med. Society----Cleveland, 1892
Wood, John S----Cleveland, Collinwood, 1880
Wood, W. H., Jefferson Co. Medical Society----Smithfield, 1892
WOODS, JOS. T., Toledo Medical Association----Toledo, 1862
Woods, Elizabeth, Toledo Medical Association----Toledo, 1892
WOODS, D. B., Trumbull Co. Medical Society----Warren, 1852
Woodruff, L., C. O. M. S----Alton, 1867
Woodbridge, Jno. E., Mahoning Co. Med. Society--Youngstown, 1886
Wright, S. St. J., Summit Co. Medical Society----Tallmadge, 1880
Wright, J. A., N. W. O. M. A----Toledo, 1892
Wright, Thos. M., Miami Co. M.-C. Soc----Troy, 1891
Wright, John H----New Lexington, 1894
Wright, Jno. W----Columbus, 1885
Wylie, J. L., Brown County Medical Society----Ripley, 1872
Yarnall, F. H., Hildreth District Medical Society--W. Lafayette, 1892
Yingling, G. E., N. W. O. M. A----Tiffin, 1892
Young, D. Howard, Erie County Medical Society----Chicago, 1892
Zenner, Phillip, Academy of Medicine----Cincinnati, 1882
Ziegler, H. H., N. W. O. M. A----Ayresville, 1884
Zinke, E. G., Academy of Medicine----Cincinnati, 1892
Zimmerman, H. A----Youngstown, 1892
Zopfi, W. J., Hancock County Medical Society----Findlay, 1891

DELEGATE MEMBERS.

Culbertson, J. C., Academy of Medicine----------Cincinnati
Huston, Wm. O., Belmont County Medical Society----------Bellaire
King, Chas. P., Hildreth District M. A----------Newark

HONORARY MEMBERS.

Roberts Bartholow----------Philadelphia, Pa., 1879
James F. Hibbard----------Richmond, Ind., 1871
E. W. Jenks----------Detroit, Mich., 1875
John Kerr----------Canton, China, 1875
N. Senn----------Chicago, 1890
Victor A. Vaughan----------Ann Arbor, Mich., 1889
Donald Maclean----------Detroit, Mich., 1894
Hunter Robb----------Baltimore, Maryland, 1894
P. Beeman----------Sidney, 1872
J. C. Blackburn----------Covington, Ky., 1857
M. H. Harding----------Lawrenceburg, Ind., 1854
R. E. Haughton----------Richmond, Ind., 1863
E. L. Hill----------Oxford, 1856
J. M. Kitchen----------Indianapolis, Ind., 1866
W. B. Lyons----------Huntington, Ind., 1866
J. F. Noyes----------Detroit, Mich., 1875
E. D. Safford----------Parkersburg, W. Va., 1870
J. M. Stevenson----------Pittsburgh, Pa., 1866
R. S. Sutton----------Pittsburgh, Pa., 1884

CONSTITUTION AND BY-LAWS

OF THE

OHIO STATE MEDICAL SOCIETY,

ADOPTED AT ZANESVILLE, MAY 16, 1894.

ARTICLE I.

TITLE.

The name of this Association shall be the "OHIO STATE MEDICAL SOCIETY."

ARTICLE II.

OBJECTS.

The objects of this Society shall be the advancement of medical knowledge; the elevation of professional character; the protection of the professional interests of its members; the promotion of all measures adapted to the relief of the suffering, the improvement of the health, and the protection of the lives of the community.

ARTICLE III.

MEMBERS.

SECTION 1. The Society shall consist of *permanent mem-*

bers, delegate members, and *honorary members.* Permanent and delegate members only shall be competent to hold office or transact the legislative business of the Society, as hereafter specified.

SEC. 2. Delegate members shall receive their appointments from auxiliary societies. Before admission to a seat they shall pay the regular dues for the year, and file with the Committee on Admission a certificate of delegation, signed by the President and Secretary of the auxiliary society which they represent. Should a delegate not become a permanent member by complying with the requirements of Sec. 3, Art. III, he shall only be entitled to a copy of the Transactions and the privileges of membership for the meeting to which he is accredited.

SEC. 3. All regularly graduated practitioners of medicine in the State of Ohio shall be eligible to permanent membership. Applicants shall be vouched for by two permanent members, or shall present a certificate of membership in an auxiliary society, signed by the President and Secretary of such society, and their election shall require a majority vote at a regular meeting, their eligibility having been reported upon favorably by the Committee on Admission.

Every applicant shall deposit with the Treasurer the sum of $3.00 as a membership fee, and the dues for the current year, if not previously paid, which sums shall be returned if his application is rejected.

SEC. 4. Members of an auxiliary society, upon the presentation of a certificate of membership, signed by the President and Secretary of such society, and complying with the provisions of Art. III, Sec. 3, shall be eligible to membership, although not in attendance on the meeting.

SEC. 5. The Society may elect eminent physicians, not residents of Ohio, as honorary members. They shall be ex-

empt from payment of dues and assessments, and shall be presented with a copy of the Transactions.

SEC. 6. Members who have paid dues for thirty consecutive years shall be known as *life members*, and be exempt from dues and assessments.

SEC. 7. Members who are delinquent in dues or assessments shall not be entitled to a copy of the Transactions.

The non-payment of dues for three years shall forfeit membership. The Treasurer shall include in his annual report the names of those who are delinquent for three years, but this list shall not be printed in the Transactions.

SEC. 8. The names of all permanent, delegate and honorary members shall be annually printed in the Transactions, in their respective classes.

ARTICLE IV.

AUXILIARY SOCIETIES.

SECTION 1. Any county or other local medical society in the State, whose Constitution recognizes the Code of Ethics of the American Medical Association, may become auxiliary to this Society, and shall be entitled to one delegate for every five members, and one additional for more than half that number.

SEC. 2. Every auxiliary society shall enforce the observance, by its members, of the Code of Ethics adopted by this Society.

SEC. 3. Any member of an auxiliary society, who is also a member of this Society, who shall feel aggrieved at the action of such auxiliary society in enforcing discipline, shall have the right to appeal to this Society.

SEC. 4. The Secretary of each auxiliary society, not less

than one month preceding each annual meeting of this Society, shall make a full and correct catalogue, with post-office addresses, of its officers and members and transmit the same to the Secretary. If the name of a member is omitted from this catalogue that was contained in the last preceding catalogue, the reason for such omission must be given.

SEC. 5. In case of the death of any of its members, who are also members of this Society, it shall be the duty of the Secretary of each auxiliary society to transmit to the Secretary of this Society a suitable obituary notice for publication.

ARTICLE V.

OFFICERS.

SECTION 1. The officers of this Society shall be a President, four Vice-Presidents, Secretary, Assistant Secretary, and a Treasurer and Librarian.

SEC. 2. At the first session of each year the President shall appoint a committee of five, which shall present to the society nominations for all elective offices except that of President. The officers shall be elected by a ballot vote of a majority of all the members present, and shall enter upon their duties at the close of the meeting at which they are elected, and shall serve one year, or until their successors are elected.

SEC. 3. All vacancies in office, occurring in the interim of the meetings, shall be filled by appointment by the President.

ARTICLE VI.

DUTIES OF OFFICERS.

SECTION 1. The President shall preside over the meet-

ings, deliver an address, and perform such other duties as custom and parliamentary usage may require.

SEC. 2. The Vice-Presidents shall assist the President in the performance of his duties, and, in his absence, preside over the meetings, in the order of their seniority.

SEC. 3. The Secretary shall keep correct minutes of the proceedings of the Society, and furnish the same to the Committee on Publication, notify committees and society delegates of their appointments, take charge of all manuscripts, papers, etc., read at the various meetings, and transfer the same to the Committee on Publication. He shall give due notice of the annual meetings, and give official notice to all auxiliary societies of resolutions, etc., passed by this Society that have reference to the said societies, and also notify them of the time for making their reports to this Society, and perform all other duties which the common usage of corporate bodies may require. His salary shall be one hundred and twenty-five dollars per annum.

SEC. 4. The Assistant Secretary shall assist the Secretary in the performance of his duties, as the latter may require, and act for him in his absence. His traveling and hotel expenses shall be borne by the Society.

SEC. 5. The Treasurer and Librarian shall receive all moneys due the Society, pay all bills countersigned by the Secretary, keeping an itemized account of all receipts and expenditures, with vouchers, and make a full report at each annual meeting. He shall have charge of all property belonging to the Society, the care of which is not otherwise provided for, keeping a complete catalogue of the same, and report the condition of this department at the annual meeting. He shall give bond for the faithful performance of his duties, in the sum of $1,000, with two sureties, said bond to be approved by the Committee on Finance, and deposited with the Secretary. His salary shall be one hundred and twenty-five dollars per annum.

SEC. 6. The officers shall deliver all records, books, funds and other property belonging to their several offices, to their successors when the latter enter upon the discharge of their respective duties.

ARTICLE VII.

COMMITTEES.

The committees of this Society shall be Standing and Temporary. Standing Committees are those whose duties continue from year to year. They shall each consist of five members, and, unless otherwise specified, shall be elected by the society, one member being elected each year. The Standing Committees shall be: Committees on Arrangements, Finance, Admission and Medical Societies, Ethics, Publication, and Medical Legislation. Temporary Committees are those whose functions cease with the meeting at which they are appointed. They shall be appointed by the President as the necessity for their existence arises.

ARTICLE VIII.

DUTIES OF COMMITTEES.

SECTION 1. The Committee on Arrangements shall, if no sufficient reasons prevent, be mainly composed of members at the place where the next annual meeting is to be held. It shall provide suitable rooms and accommodations for the meeting, and, in all matters not otherwise provided for, superintend and protect the general interests of the Society. This Committee shall be appointed annually by the President.

SEC. 2. The Committee on Finance shall fix the amount of the yearly dues and special assessments, audit the account of the Treasurer, and have general charge of the monetary affairs of the Society.

SEC. 3. The Committee on Admission and Medical Societies shall examine and pass upon the qualifications of delegates, and applicants for permanent membership, and the application for admission of auxiliary societies, and perform such other duties as may devolve upon it.

SEC. 4. The Committee on Ethics shall examine and report for the action of the Society, all cases of appeal from the auxiliary societies, and such other matters as may be referred to it by the Society. If any member or auxiliary society shall be charged, in writing, with any violation of the provisions of this Constitution and By-Laws, or with unprofessional conduct, a copy of such charges shall be furnished to him or its officers, and the accused and accuser cited to appear, when the Committee shall proceed to hear the case, reserving its decision to be reported to the Society; except that the case of any member may be referred for adjudication to the auxiliary society of which he is a member, and from the decision of the auxiliary society an appeal may be carried to this Society.

Reports from this Committee, when unanimous, shall be acted upon without debate.

SEC. 5. The Committee on Publication, of which the President and Secretary shall be members *ex officio*, shall examine all papers presented to the Society, and have printed in the Transactions such as it deems worthy of publication.

SEC. 6. The Committee on Legislation shall watch the course of State legislation on medical subjects, and take charge of such matters as shall be referred to it by the Society. All proposed legislation offered by any member of this Society, and all resolutions touching medical legislation, shall be referred to this Committee, which shall make a report thereon to this Society as soon as possible.

ARTICLE IX.

DELEGATES.

SECTION 1. The Delegates appointed by this Society to the American Medical Association or other societies, shall report briefly, in writing, through their Chairman, any action of the societies to which they were respectively delegated, which, in their judgment, merits the attention of this Society.

ARTICLE X.

MEETINGS.

SECTION 1. The meetings of this Society shall be held annually, at such time and place as the Society may appoint: *Provided*, that special meetings may be called at any time by the President, on the written request of twenty five members. Due notice of all the meetings shall be given by the Secretary, and in case of a special meeting the object for calling said meeting shall be distinctly set forth in the notice.

SEC. 2. Twenty-five members shall constitute a quorum for the transaction of business.

ARTICLE XI.

CODE OF ETHICS.

The Society adopts, as a part of its regulations, the Code of Ethics of the American Medical Association.

ARTICLE XII.

AMENDMENTS.

Every proposal for amending the Constitution shall be

made in writing; and if such an amendment receive a majority of four-fifths of the members present, it shall be adopted; but otherwise, the amendment shall lie over until the next meeting, when it may be adopted by a majority of two thirds of the members present.

Article XIII.

Nothing in this Constitution shall be so construed as to deprive any one now a member of this Society of any rights or privileges held by him before the adoption of this Constitution.

BY-LAWS.

I.

ORDER OF BUSINESS.

1. The President, or in his absence, one of the Vice-President, shall call to order, or, in case of the absence of all these officers, a chairman shall be appointed *pro tempore*.

2. Reading of minutes. Report of the Committee of Arrangements (on first day).

3. President's address (afternoon of second day).

4. Election of officers (afternoon of second day).

5. Selection of a place and time for the next meeting (afternoon of second day).

6. Business which requires early consideration.

7. Reports of Standing Committees.

8. Reports from Delegates to the American Medical Association, and other Societies.

9. Written communications on medical subjects (papers).

10. Oral communications.

11. New business.

12. Unfinished and miscellaneous business.

13. Adjournment.

II.

In filling blanks, the longest time and the largest sum shall be first put.

III.

Any three members may call for the ayes and nays.

IV.

All questions of order, not especially provided for, shall be decided according to Cushing's Manual of Parliamentary Practice.

V.

Not to exceed twenty minutes shall be allowed for the reading of any paper.

VI.

No paper shall occupy over thirty pages of the Transactions.

VII.

All reports, papers and addresses presented to this Society by its members are the property of the Society, and shall be referred, without motion and without recommendation, to the appropriate committee; and it shall be considered a misdemeanor for the author of any such report or paper to permit the same to be published without giving due credit to this Society.

VIII.

No speaker shall be allowed to speak a second time, on the same subject, without consent of the Society.

IX.

The time allowed each speaker shall not exceed ten minutes, except by general consent.

X.

The motion to adjourn, to lie on the table, or for the previous question, shall be decided without debate.

XI.

The motion for the previous question, if decided in the negative, shall have no effect on the main question.

XII.

Any of these By-Laws may be suspended at any time by a three-fourths vote of the members present. Every proposed amendment must be offered in writing; if it receive a four-fifths vote of the members present, it shall be adopted; but otherwise it shall lie over until the next meeting, when it may be adopted by a majority of two-thirds of the members present.

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